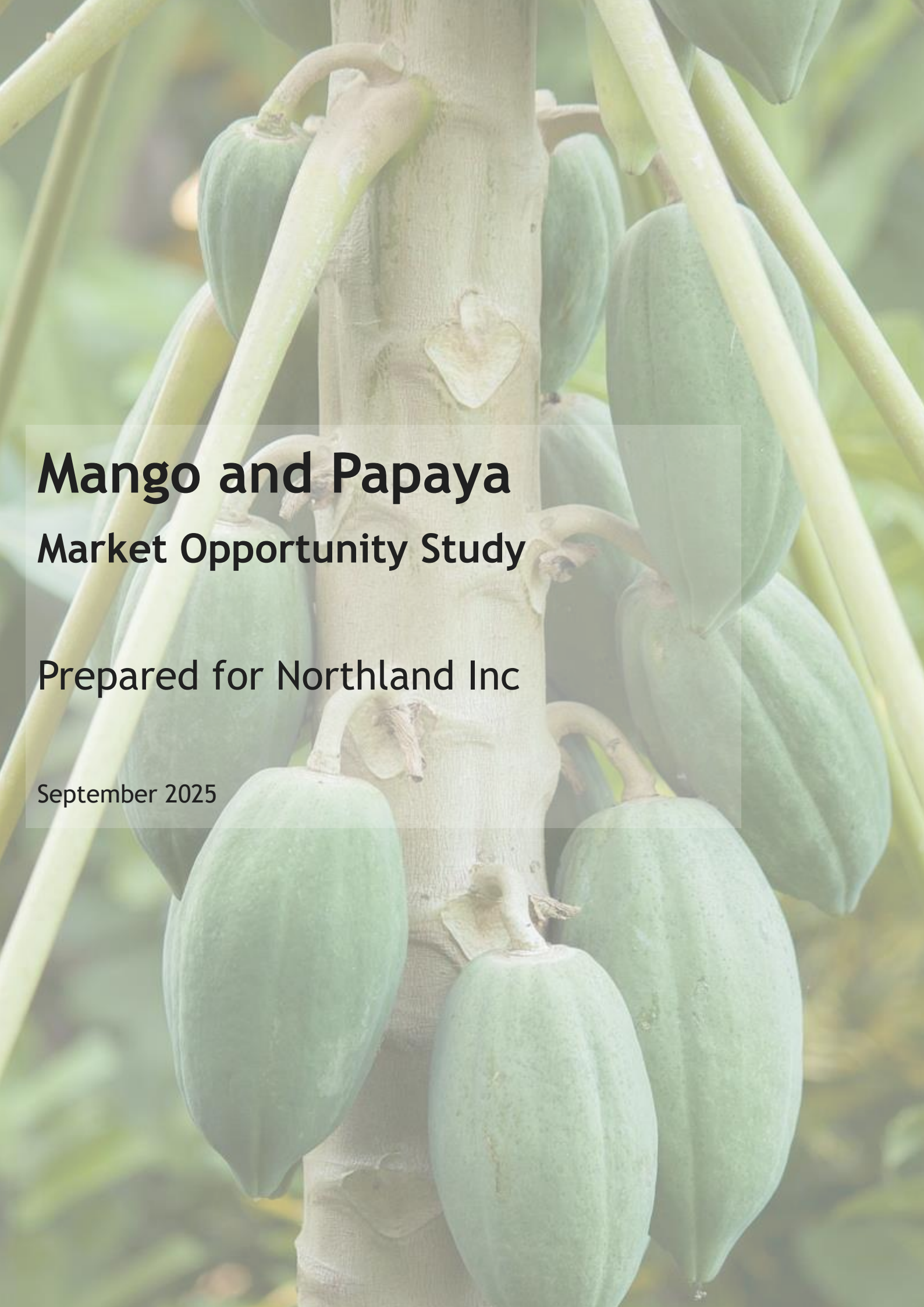

Mango and Papaya

Market Opportunity Study

Prepared for Northland Inc

September 2025

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Executive Summary

Te Tai Tokerau-Northland is entering a new era of horticultural potential. As climate change reshapes the country's growing conditions and consumers demand healthier, more sustainable food, opportunities are emerging for crops once considered not suitable for growing in New Zealand. Among them are mango and papaya, two crops that dominate import shelves and have not traditionally been grown at local farms. For Te Tai Tokerau-Northland, the question is to what extent these crops can shift from curiosity and small-scale production to commercial reality, and in doing so, deliver new jobs, horticultural innovation, and economic impact.

Northland Inc commissioned BDO to prepare this study to examine the feasibility of developing a mango or papaya industry in Te Tai Tokerau-Northland. The purpose of the analysis is to assess whether these sub-tropical crops could be commercially produced in the region and supported through value-add processing industries. The project was delivered through three core phases including stakeholder engagement, a market scan of domestic and international industries, and economic modelling. Consultations were held with growers, nurseries, processors, research institutions, and industry bodies to capture the breadth of opportunities and challenges across the supply chain. These insights were supplemented by international case studies and comparative analysis of horticultural success stories. Finally, modelling was undertaken to assess the potential economic impact of a mature mango or papaya industry in Te Tai Tokerau-Northland.

The Current State of Mango and Papaya Industries in New Zealand

At present, New Zealand is almost entirely reliant on imports of mango and papaya. In 2023, mangoes were primarily imported from Australia, Mexico, and Peru, while papayas arrived mostly from the Philippines and Fiji. The local industry remains nascent, with small scale growers and nurseries trialling cultivars, with small, but promising yields recorded. Fresh produce grown in Te Tai Tokerau-Northland is mostly supplied to consumers through farm-gate sales, farmer's markets and regional organic produce stores. A number of Te Tai Tokerau-Northland growers are also actively exploring the commercial potential of papaya-based value-add products, particularly for use in health and wellness sector products.

Given that the majority of mango and papaya supply is imported, the size of the respective fresh fruit industries in New Zealand can be ascertained through import statistics. Table 1 outlines that in 2024, the size of the New Zealand fresh mango and papaya industries was approximately $11.5 million and $2.1 million, respectively. This provides an indication of the size of the market opportunity in which Te Tai Tokerau-Northland growers are targeting.

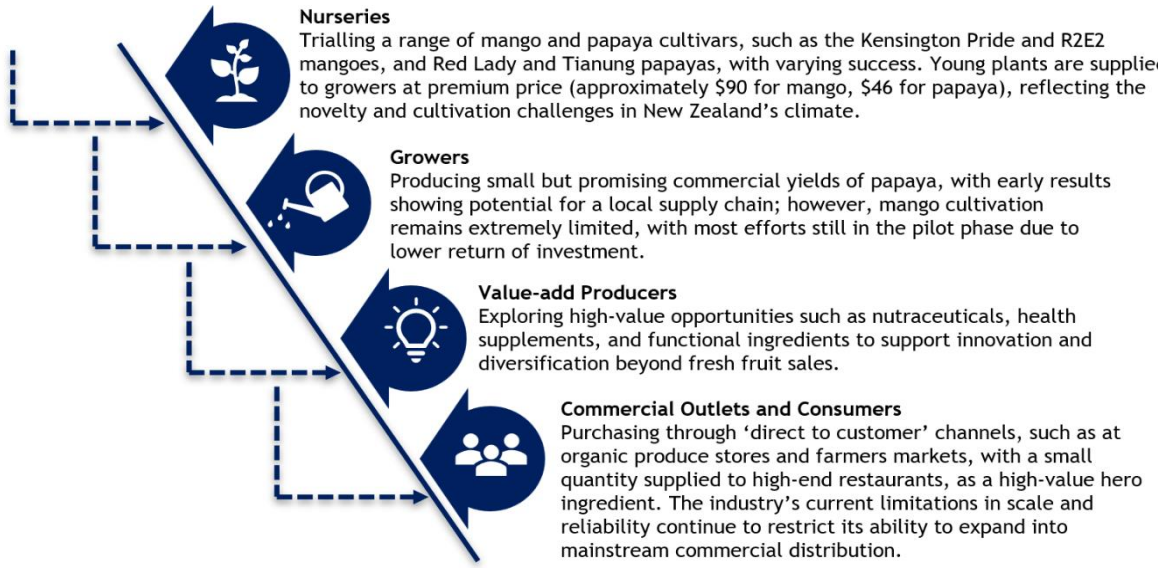
Table 1: FY2024 Fresh Import Statistics of Mango and Papaya

	Import Quantity (tonnes)	Value for Duty per Tonne ($)	Industry Size ($m)
Mango	2,244.56	$5,115	$11.5
Papaya	697.47	$3,011	$2.1

There is also a strong and growing market for mango and papaya value add products in New Zealand. For example, import data shows that the dried mango market has expanded from just over $1.1 million in 2019 to nearly $4.7 million in 2025[1].

A high-level overview of the current domestic supply chain is outlined in Figure 1.

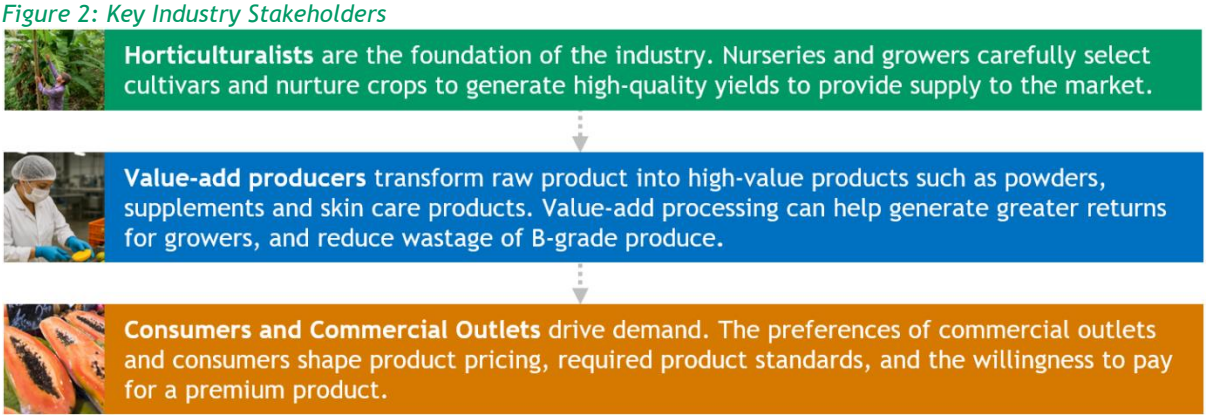
Figure 1: Current State Domestic Supply Chain for Mango and Papaya in Te Tai Tokerau-Northland



Market Analysis

The success of developing a mango or papaya industry in Te Tai Tokerau-Northland is dependent on the viability of operations for each stakeholder group within the supply chain. The primary stakeholder groups, shown in Figure 2, face unique challenges and opportunities that impact their ability to be financially sustainable and participate in the supply chain.

Figure 2: Key Industry Stakeholders



[1] Statistics New Zealand, https://www.stats.govt.nz/topics/imports-and-exports/

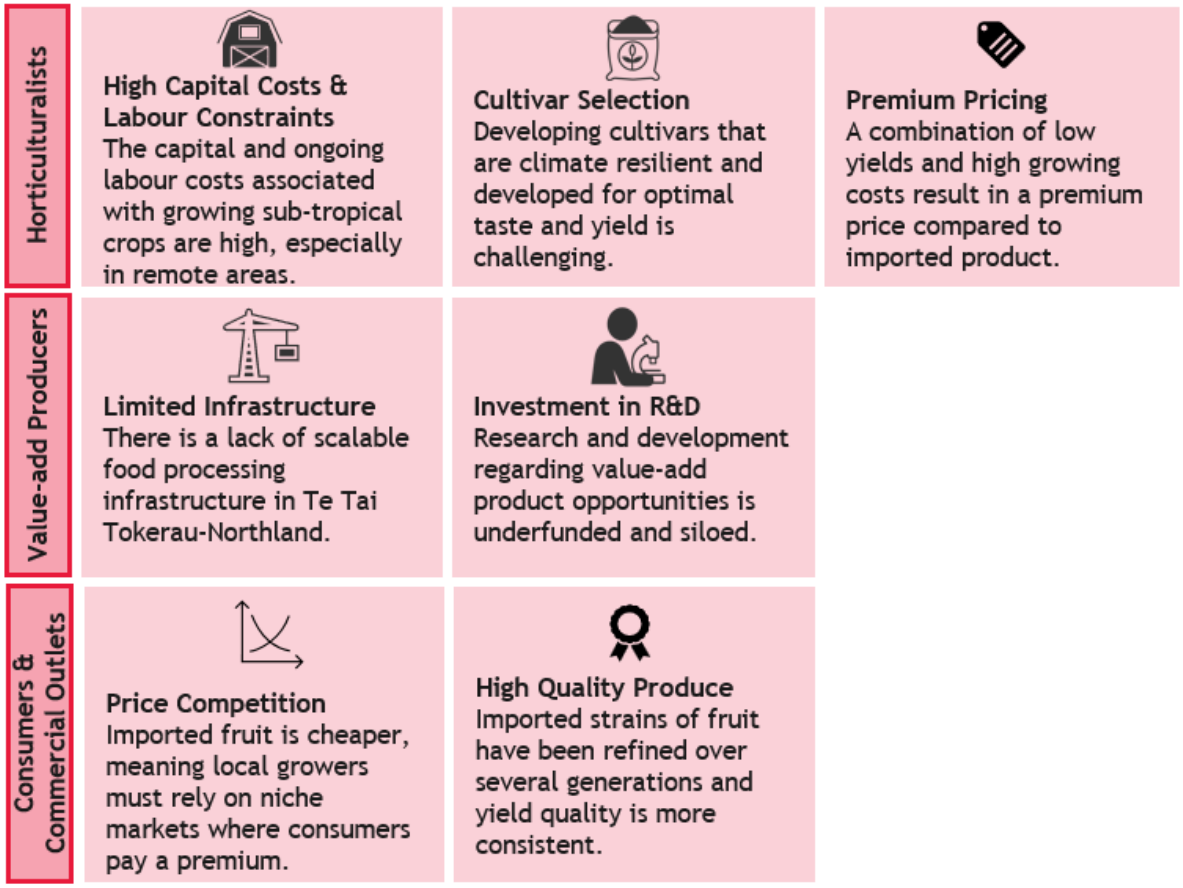
Key Challenges

Developing a mango or papaya industry in Te Tai Tokerau-Northland faces several significant challenges that must be carefully managed. The high capital costs associated with protected cropping systems, which are essential to achieving reliable yields, create a major barrier to entry for new growers. In addition, the local workforce has limited experience in specialised sub-tropical horticulture, and high wages increase ongoing operational costs, placing further pressure on growers.

Yield variability and quality consistency are also critical concerns. Loss rates of 5–20 percent are common, and B-grade fruit that fails to meet premium standards can be difficult to sell, impacting profitability. Compounding these challenges is the lack of local processing infrastructure. Currently, many producers must transport fruit to distant facilities, such as those in Auckland, for value-add processes like freeze-drying, which adds both cost and logistical complexity. Finally, New Zealand-grown mango and papaya are more expensive to produce than imported fruit, limiting their competitiveness in mainstream supermarkets and confining market opportunities primarily to niche and premium segments.

An overview of the distinct challenges faced by each stakeholder group is illustrated in Figure 3 below.

Figure 3: Key Stakeholder Challenges



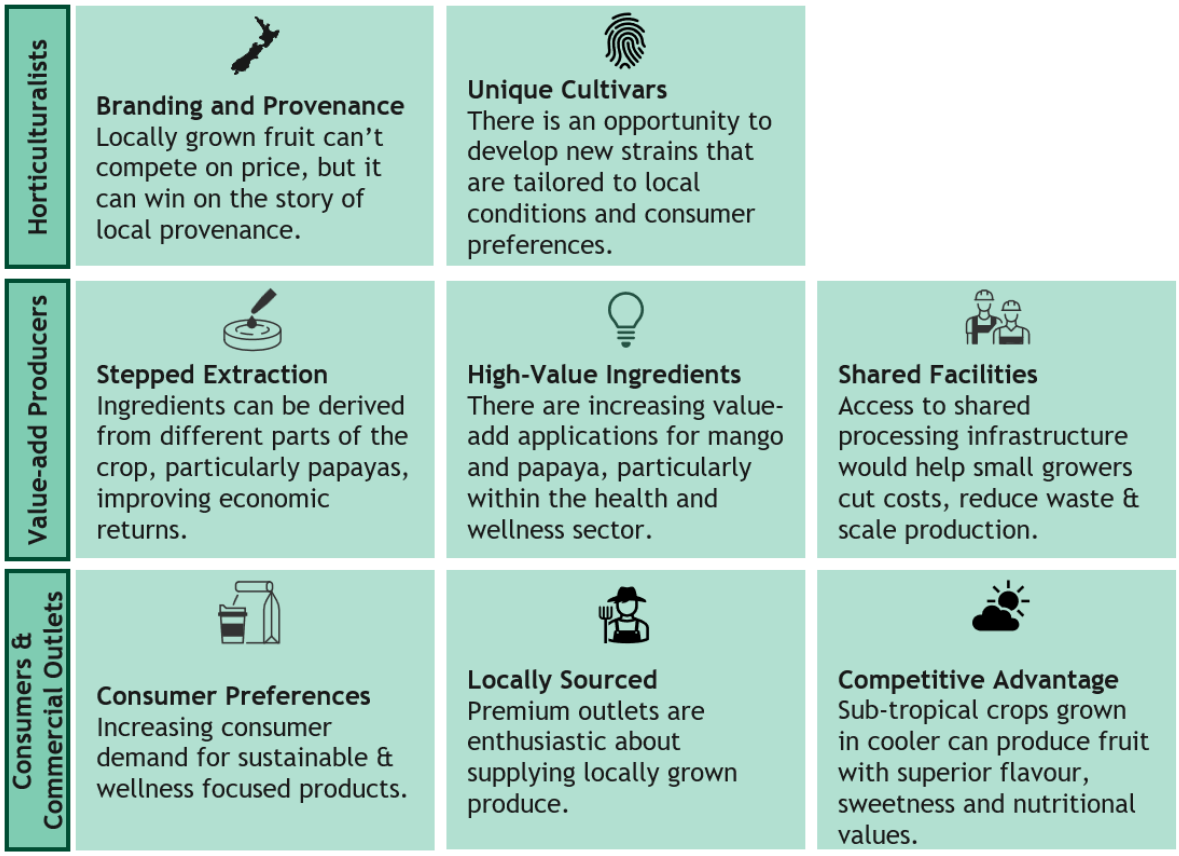
Key Opportunities

Despite the aforementioned hurdles, sub-tropical crop industries have significant growth potential. Te Tai Tokerau-Northland's climate is becoming increasingly suitable for sub-tropical fruit cultivation, while consumer demand for locally grown, provenance-based produce continues to rise. Niche markets, including organic retailers, high-end restaurants, and wellness product manufacturers, are willing to pay premium prices for fruit with a strong story of origin, sustainability, and superior nutrition. Slower-maturing local fruit may also offer enhanced flavour and nutritional profiles, which could underpin a distinctive premium brand.

Value-add processing presents one of the most promising avenues for growth. Mango and papaya offer diverse applications in functional foods, nutraceuticals, and cosmetics, with papaya's by-products such as papain, seeds, leaves, and skins providing particularly broad commercial potential. By investing in research and development, the industry can improve cultivars, refine processing techniques, and develop new high-value products that differentiate New Zealand-grown fruit from imports.

An overview of the distinct opportunities for each stakeholder group is illustrated in Figure 4 below.

Figure 4: Key Stakeholder Opportunities



Economic Analysis

To assess the economic potential of either a mango or papaya industry in Te Tai Tokerau-Northland, two hypothetical scenarios were developed. In each scenario, it was assumed that 20 hectares of land are utilised for mango or papaya growing, and that Te Tai Tokerau-Northland has the required infrastructure for growing (e.g. covered cropping infrastructure). Bother scenarios imagine a future state where there is sufficient manufacturing capacity and capability to support either mango or papaya freeze drying. The two scenarios include:

Scenario 1: Mango Industry

The economic analysis is focused on mango horticulturists and value-add producers. For a typical mango orchard, it could be expected that ten per cent of fruit is lost to disease, pests, weather, and other factors. The remaining yield could plausibly be split as follows:

- 80 per cent for sale as fresh fruit. This could be at farm-gate, online, local farmers markets, or sale to distributors and on to retailers.
- 10 per cent sent on to further stages of processing into high value manufactured goods, more specifically, freeze dried product.

Scenario 2: Papaya Industry

The economic analysis is focused on papaya horticulturists and value-add producers. For a typical papaya orchard, there would be a higher focus on high value manufacturing relative to mangoes because of its natural properties (e.g. enzyme in papaya, papain). The economic model assumes that around ten per cent of crop is lost to disease and pests. The remaining crop is split as follows:

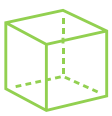
- 30 per cent for sale as fresh fruit. This could be at farm-gate, online, local farmers markets, or sale to distributors and on to retailers.
- 60 per cent sent on to further stages of processing into high value manufactured goods, more specifically, freeze dried product.

Economic Outcomes

Scenario 1: Mango Industry

Assuming 20 hectares of available land and yields of seven (7) tonnes per hectare, approximately 140,000 kilograms of mango will be produced annually. After accounting for losses, around 112,000 kilograms would be sold as fresh fruit at an estimated $3.50 per kilogram, generating $390,000 in annual revenue for growers. An additional 14,000 kilograms would be processed into freeze-dried mango powder, producing $52,000 in manufacturing revenue. Overall, the total industry revenue is projected to reach approximately $442,000 per year.

In terms of the impact on Te Tai Tokerau-Northland's economy, the establishment of a mango industry could generate up to $180,000 GDP directly in a typical year, plus a further $160,000 GDP through flow on effects, for a total contribution of $340,000 to the region's GDP. The development of a 20-hectare mango growing industry plus associated manufacturing industry is also expected to increase employment, resulting in the creation of five new FTEs in Te Tai Tokerau-Northland.



20 hectares of land

140 tonnes of mango

5 new total FTES in Te Tai Tokerau-Northland

$340K in total GDP

Scenario 2: Papaya Industry

Assuming 20 hectares of available land and yields of 40 tonnes per hectare, approximately 800,000 kilograms of papaya will be produced annually. After accounting for losses, around 240,000 kilograms would be sold as fresh fruit at an estimated $5.0 per kilogram, generating $1.2 million in annual revenue for growers. An additional 480,000 kilograms would be processed into freeze-dried papaya powder, producing $1.53 million in manufacturing revenue. Overall, the total industry revenue is projected to reach approximately $2.7 million per year.

In terms of the impact on Te Tai Tokerau-Northland's economy, the establishment of a papaya industry could generate up to $2.06 million GDP directly in a typical year, plus a further $390,000 GDP in flow on effects, for a total of $2.45 million GDP. The development of a 20-hectare papaya industry is also expected to increase employment in Te Tai Tokerau-Northland, resulting in the creation of 13 new FTEs in the region.

Economic modelling indicates that a papaya industry is more commercially viable for stakeholders and has significantly stronger potential impacts on Te Tai Tokerau-Northland's GDP and employment compared to a mango industry. The higher yields, stronger processing opportunities, and consumer demand for papaya-based products all point toward papaya as the more viable commercial prospect.

It is important to note that the outcomes presented in this economic analysis are indicative only, and assess the entire market based on a modelled scenario of a 20-hectare operation. Actual results may vary between individual growers and value-add producers due to differences in site conditions, management practices, cultivar selection, and infrastructure.

Summary of Industry Feasibility

The feasibility of developing mango and papaya industries in Te Tai Tokerau-Northland differs considerably. While there may be a small niche consumer market willing to pay a premium for locally grown mangoes, the overall outlook for growers and processors is unlikely to be feasible at a broader consumer market level.

In contrast, papaya demonstrates stronger potential across the value chain. Higher land use efficiency, the ability to command premium prices, and opportunities for extensive value-added processing translates into greater economic returns and job creation. Table 2 and Table 3 provide an overview of the feasibility of each market for horticulturists, value-add producers, and consumers and commercial outlets.

*Table 2: Te Tai Tokerau-Northland Mango Industry Feasibility**

Stakeholder Group	Comments	Overall Feasibility for Stakeholder
Horticulturalists	The development of commercial production would require substantial capital investment, particularly in covered cropping infrastructure, alongside high operational costs in the early stages. Yields are projected to be relatively low when compared to other subtropical crops, which further diminishes profitability. Although locally grown mangoes could command a premium due to their provenance, their higher cost compared to imports makes large-scale cultivation unlikely to be feasible in this region.	 **Unlikely to be feasible**
Value-add Producers	While research could identify viable products, this process would be timely and costly. The establishment of dedicated food processing facilities would require significant upfront investment, with limited returns, as mango-derived products do not currently attract the same price premiums as other specialty crops. These factors combine to make mango processing an unlikely prospect for commercial feasibility at this stage.	 **Unlikely to be feasible**
Consumers and Commercial Outlets	Mangoes grown in Te Tai Tokerau-Northland have demonstrated that they can meet quality standards and potentially command a premium price. However, scaling up production to deliver consistent quality remains a major challenge. Prices are also likely to remain higher than imported alternatives due to the absence of economies of scale. Despite these limitations, there are encouraging signals of shifting consumer preferences, which increasingly favour locally grown, sustainable, and health-oriented products, even at a higher price point. This suggests potential for a limited niche market, however, feasibility on an industry-wide level is questionable.	 **Potentially feasible**

*Representative of the market outcome, results may differ for each stakeholder.

*Table 3: Te Tai Tokerau-Northland Papaya Industry Feasibility**

Stakeholder Group	Comments	Overall Feasibility
Horticulturalists	Papaya trees are able to be planted at higher density, land use efficiency is strong, and the crop offers relatively higher yields per hectare than many alternatives. While operational costs are significant, the ability to command premium prices for locally grown fresh papaya supports stronger margins. Ensuring that cultivars are suited to Te Tai Tokerau-Northland's environment will be critical to achieving consistent yields and maintaining eating quality. Importantly, local provenance provides an additional market advantage, positioning papaya as a likely feasible opportunity for growers.	 **Likely feasible**
Value-add Producers	Papayas can be almost fully utilised in processing, with fruit, skin, leaves, and seeds all capable of being turned into commercial products. This not only enhances profitability but reduces waste. While research and development are needed to bring these opportunities to market, and significant funding would be required to establish processing facilities, the potential returns are compelling.	 **Likely feasible**
Consumers and Commercial Outlets	Early-stage trials have demonstrated that high-quality papaya can be relatively consistently produced. As with mangoes, locally grown papayas will remain more expensive than imports due to the absence of economies of scale, but consumer trends are favourable. A growing demand for sustainable, locally sourced, and health-oriented products indicates there is room in the domestic market for a premium offering. This positions papaya as potentially feasible for consumers and commercial outlets, provided quality and branding are maintained.	 **Potentially feasible**

*Representative of the market outcome, results may differ for each stakeholder.

Implementation Plan

Although the feasibility of a mango or papaya industry in Te Tai Tokerau-Northland has some fundamental challenges commercially, if the market wishes to pursue the development and growth of either industry, there are a number of recommended short (0 - 2 years), medium (3 – 4 years) and long term (5+ years) actions that could be pursued to drive industry growth.

Short Term Implementation Actions

	Action	Detail
	**Agronomic studies and identification of available land**	Commission detailed agronomic studies to assess the suitability of Te Tai Tokerau-Northland's microclimates (e.g. soil, rainfall, humidity, wind shelter) for both mango and papaya varieties.
	**Cultivar research and trials**	Northland Inc to partner with local growers, Iwi landowners and horticultural research institutions to fund small plant trial plots of varying mango or papaya cultivars. Additional genetic research could also undertake in relation to the crossbreeding of plants to develop a mango or papaya that has a superior yield and taste profile.
	**Investigate optimal crop cover systems**	Investigate cost effective cropping solutions and coordinate the procurement of covered cropping infrastructure.
	**Industry Engagement and Partnerships**	Northland Inc to establish a Te Tai Tokerau-Northland Sub-tropical Fruits Working Group, made up of growers, Māori landowners, food processors, researchers, marketers and others. The intention is for this group to be incubated by Northland Inc, but eventually industry led. The role of this group will be to share knowledge, discuss opportunities for industry collaboration, as well as determine and implement priority actions to support the development of the sub-tropical fruit industry in Te Tai Tokerau-Northland.

Medium Term Implementation Actions

	Action	Detail
	**Value-add product analysis**	Partner with research institutions and food processors to undertake in-depth research to develop value-add products, explore opportunities to utilise b-grade produce, and assess the likely size of export markets for mango or papaya value-added products.
	**Detailed Business Case for food processing facility**	Leveraging the existing *Food North Food and Beverage Business Case*, Northland Inc to co-develop an investment grade detailed business case for a food processing facility in Te Tai Tokerau-Northland. This detailed business case should be leveraged to proactively advocate for funding to develop a value-add food processing facility.

	Action	Detail
	**Training and workforce development**	Partner with industry and educational bodies to develop horticultural training programmes or micro-credentialing courses in sub-tropical fruit growing production and post-harvest handling.

Long Term Implementation Actions

	Action	Detail
	**Construct food processing facility**	Construct a food processing and packaging facility in Te Tai Tokerau-Northland to support the development of local mango or papaya value-added products, among other crops.
	**Promote NZ produce and its unique factors in a coordinated way**	Actively create and promote a Te Tai Tokerau-Northland grown fruit brand, leveraging provenance, New Zealand's story, food safety credentials, and Māori growing principles. To ensure success, a marketing body could be established to act as the single global marketer for New Zealand-grown mango or papaya.

1 Introduction and Approach

New Zealand's horticulture sector is renowned for innovation, quality and adaptability, with success growing and suppling both domestic and international markets with produce such as apples and kiwifruit. Te Tai Tokerau-Northland's economy has long depended on the jobs and economic growth created by the primary and associated manufacturing sectors, which form close to 80 per cent of the regions exports.[2] Te Tai Tokerau-Northland presents a promising opportunity for the cultivation of sub-tropical crops in New Zealand.

Climate change continues to reshape primary sector opportunities across New Zealand. Te Tai Tokerau-Northland stands to benefit from warmer temperatures and longer growing seasons, creating new opportunities for crop diversification and resilience. However, these gains are tempered by greater uncertainty and variability in weather patterns, which heighten the need for robust crop protection strategies to manage emerging risks and ensure sustainable production.

Alongside this, changing consumer preferences, driven by growing demand for organic, nutritious and wellness-based lifestyles, is bolstering market demand for sub-tropical crop in New Zealand. However, further investigation is needed to understand the financial viability of establishing a sub-tropical crop industry in Te Tai Tokerau-Northland.

1.1 Project Context and Engagement Objective

Northland Inc, Te Tai Tokerau-Northland's economic development agency, has a responsibility to lead, support and help the horticulture industry deliver solutions which will enable growth. Northland Inc engaged with the community through the Pūtake Whakatupu Foundation for Growth Opportunity Workshop series in 2024, in response to the evolving climate and consumer preferences. This series of workshops provided insight into potential cropping and manufacturing options in the region. Two of the identified crops were ***Mangifera indica*** **(mango)** and ***Carica papaya (*****papaya)**.

To substantiate the findings from the workshop series, Northland Inc has engaged BDO Project and Infrastructure Limited (BDO) to undertake an evidence-based analysis of the feasibility and potential economic impact of developing a mango or papaya industry in Te Tai Tokerau-Northland.

This report explores the feasibility of developing a mango or papaya industry in the region, including the potential size and scale of the industry, value-add manufacturing opportunities, market dynamics and the expected economic outcomes for various stakeholders across the supply chain. Investigations into the agronomy of cultivating these crops, and the required growing conditions, are excluded from the scope of this report.

1.2 Methodology and Approach

This report was developed across three phases, including stakeholder engagement, a market scan and economic modelling. This phased approach was required given the infancy of both the mango and papaya industry in the region, and the absence of established and reliable industry data sources.

Information used in the analysis was sourced through consultations with key industry stakeholders and strengthened through a market scan, which included desk-top research and the assessment of international mango and papaya industries.

[2] Infometrics New Zealand, https://infometrics.co.nz

This report combines qualitative and quantitative findings regarding the current and future state of the mango and papaya industries in the region. Sections 1.2.1 - 1.2.3 provide a more detailed outline of the approach to each phase of work.

1.2.1 Stakeholder Consultation Approach

Effective stakeholder engagement was central to this process, as gathering diverse and informed perspectives is central to assessing the feasibility of developing a mango or papaya industry in the region. The consultation process was undertaken with key industry stakeholders identified by Northland Inc and supplemented with additional industry contacts. The key stakeholders engaged included horticulturalists, value-add producers, industry bodies and innovation institutes within New Zealand. Consultation questions were tailored to each stakeholder, with discussions centred around the following high-level themes:

- Current level of mango and papaya production in Te Tai Tokerau-Northland, and the potential size of the mango or papaya market as a result of varying levels of investment.
- Existing infrastructure, and the challenges and opportunities of key players in the supply chain that need to be addressed to develop the mango or papaya industry in Te Tai Tokerau-Northland.
- Potential for value-add manufacturing of mango or papaya, and the investment that would be needed to facilitate this.
- The economic impact of the business model and commercial feasibility of mango or papaya production in Te Tai Tokerau-Northland, for both growers and value-add manufacturers.
- The success stories, strategies and lessons learnt from other horticulture industries of varying scales in New Zealand, and how these learnings could be applied to the mango or papaya industry.

1.2.2 Market Scan Approach

Comprehensive desktop research and market scanning was undertaken to complement stakeholder insights. This involved reviewing existing domestic and international industry data and market reports to assess the current and potential size of the mango and papaya sectors in Te Tai Tokerau-Northland, including both fresh and processed product segments.

This research aimed to identify strategic opportunities for growth, innovation and investment within the sub-tropical crop sector. It also provided a broader understanding of supply chain dynamics, consumers trends and international benchmarks from more established markets.

1.2.3 Economic Analysis Approach

Leveraging the learnings from both stakeholder consultation and the market analysis, economic modelling was undertaken to understand the potential economic impact of a mango or papaya sector for Te Tai Tokerau-Northland’s economy.

To estimate the potential economic impact of a mature mango and papaya growing industry, an Input-Output (IO) modelling approach has been used. IO modelling provides a framework for understanding how various parts of an economy are interconnected, and how economic shocks (i.e. the establishment of a mango or papaya industry in Te Tai Tokerau-Northland) can have impacts that spread throughout the economy.

This framework requires an estimate of revenue and operating expenses for the industry, which was obtained through stakeholder consultation and market analysis, and was used as inputs into BDO's Regional Industry Structure and Employment (RISE) model. The RISE model has been developed and refined by BDO for over a decade, with further model detail and approach provided in Chapter 4.

1.3 Report Structure

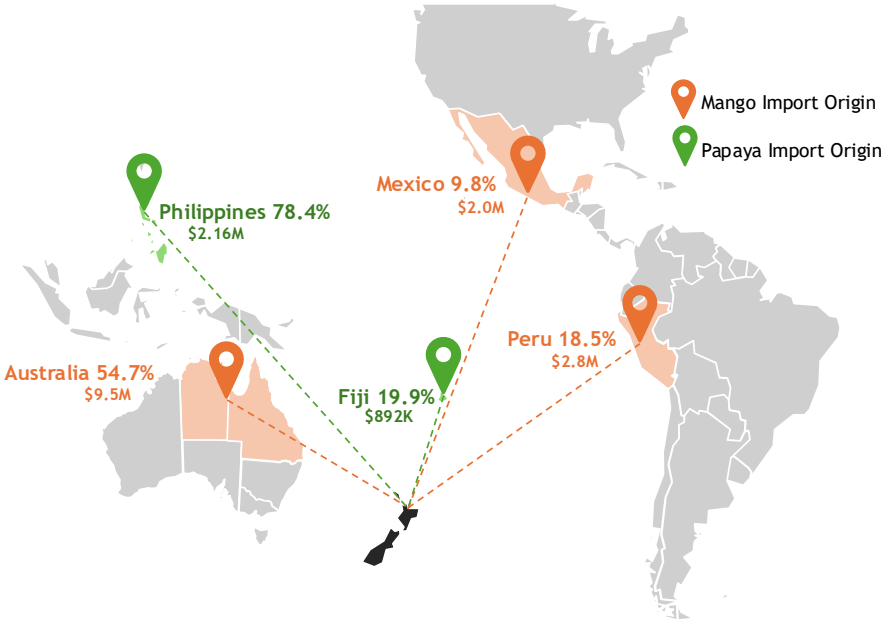
The content of this report investigates the mango and papaya industries in Te Tai Tokerau-Northland in the current state, as well as the potential growth opportunity. The contents of this report include:

- **Chapter 1: Introduction and Approach** - Introduces the project context, purpose, and approach in relation to the development of this report.
- **Chapter 2: The Current State - Mango and Papaya Industries in New Zealand -** Describes the current state of the mango and papaya industries in New Zealand, including the scale of domestic production, and the reliance on imported crops to meet demand.
- **Chapter 3: Market Analysis -** Identifies the key current state and future state stakeholders within the mango and papaya industry supply chains (horticulturalists, value-add producers and customers and commercial outlets), and the key challenges and opportunities faced by each group.
- **Chapter 4: Economic Analysis -** Details the commercial feasibility and expected economic impact of developing a mango or papaya growing and processing industry in Te Tai Tokerau-Northland.
- **Chapter 5: Summary of Industry Feasibility** – Considering all analysis undertaken, provides an overview of the feasibility of a mango or papaya industry in Te Tai Tokerau-Northland, from the perspective of each key industry stakeholder group.
- **Chapter 6: Implementation Plan and Next Steps** - Outlines actionable steps for Northland Inc to support the continued development of a mango or papaya sector in Te Tai Tokerau-Northland.

2 The Current State - Mango and Papaya Industries in New Zealand

Fresh mango and papaya produce are becoming increasingly popular in New Zealand due to their flavour and nutritional value. Currently, New Zealanders rely heavily on imported produce to meet demand for mango and papaya. As shown in Figure 5, New Zealand's supply of fresh mango is primarily sourced from Australia, Peru and Mexico, whilst papaya imports tend to come from the Philippines and Fiji.

Figure 5: Top origin countries of New Zealand's fresh mango and papaya fruit imports in 2023



Figures do not sum to 100% as only the primary origin countries are represented in the graphic.
Data source: World Integrated Trade Solution, New Zealand Papaws (papayas), fresh imports by country 2023 and World Bank, and, New Zealand Guavas, mangoes and mangosteens fresh imports by country 2023.

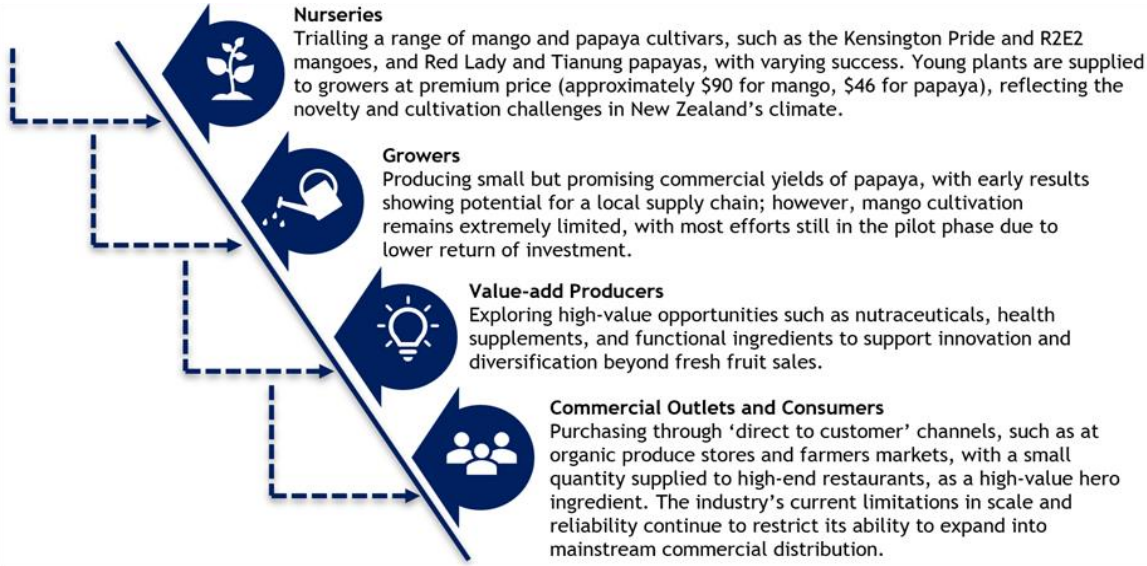
Historically, New Zealand was considered unsuitable for the cultivation of mango and papaya crops due to its cooler climate. However, as the climate has warmed, particularly in the northern areas of New Zealand, this has been re-evaluated. Small, yet promising, mango and papaya yields have been recorded in Te Tai Tokerau-Northland through covered cropping growing practices.

In the current state, small-scale domestic growers tend to offer fresh fruit directly to consumers through farm-gate sales, farmer's markets and regional organic produce stores. There remains a significant shortfall between the level of produce supplied by local growers, and the consumer demand for these crops in New Zealand. Both the local mango and papaya industries remain nascent.

Despite its modest scale, both the domestic mango and papaya industries are showing promising signs of growth. This is particularly true regarding papaya, yields are increasing year on year, as is crop quality and consistency. This comes as growers and nurseries continue to refine plant stock to better suit the region's conditions. Research into climate-adapted varieties and protected cropping techniques is also helping to overcome environmental challenges. Additionally, there is growing interest and research being undertaken in value-added products, driven by consumer preferences shifting towards holistic health products. While the industry is still small, these developments suggest a positive trajectory toward improved industry sustainability and commercial viability.

The key participants in the current domestic mango and papaya supply chain are included in Figure 6.

Figure 6: Current State Domestic Supply Chain for Mango and Papaya in Te Tai Tokerau-Northland



New Zealand Mango and Papaya Market Size

Given that the majority of mango and papaya supply is imported, the size of the respective fresh fruit industries in New Zealand can be ascertained through import statistics. Table 4 outlines that in 2024, the size of the New Zealand fresh mango and papaya industries was approximately $11.5 million and $2.1 million, respectively. This provides an indication of the size of the market opportunity in which Te Tai Tokerau-Northland growers are entering.

Table 4: FY2024 Fresh Import Statistics of Mango and Papaya[3]

	Import Quantity (tonnes)	Value for Duty per Tonne ($)	Industry Size ($m)	Value for Duty per kg ($)
Mango	2,244.56	$5,115	$11.5	$5
Papaya	697.47	$3,011	$2.1	$3

*Value for Duty is the value of imports before freight and insurance costs are added.

There is also a strong and growing market for mango and papaya value add products in New Zealand. For example, import data shows that the dried mango market has expanded from just over $1.1 million in 2019 to nearly $4.7 million in 2025.

[3] Fresh Facts. (2024). United Fresh New Zealand Incorporated. https://unitedfresh.co.nz/assets/site/Fresh-Facts-2024-%E2%80%93-Online-Version.pdf

Key Insight for the New Zealand Market:

New Zealand's substantial imports of both fresh mango and papaya suggest strong domestic demand, highlighting the potential for locally grown alternatives. The per kilogram value of $5 for mango and $3 for papaya provides a guide for the opportunity for local growers. Papayas, in particular, are poorly suited to long-distance transport due to their thin skin, which compromises shelf life and quality. This creates an opportunity for locally grown papayas to command premium prices by offering superior freshness and quality.

3 Market Analysis

This chapter details the feasibility of developing a mango or papaya industry in Te Tai Tokerau-Northland and independently evaluates the viability for each stakeholder group in a high-level supply chain. This includes 'horticulturalists'' (nurseries and growers), 'value-add producers' (fruit processors and product innovators), and 'consumers and commercial outlets' (demand-side stakeholders, including markets, restauranteurs and individual consumers). Each stakeholder group faces distinct challenges and opportunities, and their ability to be financially sustainable and participate in the supply chain, will determine the overall success of the industry.

Section 3.1-3.3 have been developed based on insights from stakeholder consultation, in combination with desktop research. These insights form key considerations for the economic analysis in Chapter 4 below.

3.1 Horticulturalists

The feasibility of mango and papaya cultivation in Te Tai Tokerau-Northland hinges on several key factors:

- Positive gross profit per hectare, ensuring crops are economically viable.
- Low opportunity cost, indicating few alternative crops offer better returns under similar conditions.
- Reliable supply of planting material from nurseries.
- Access to suitable land and key capital infrastructure, such as covered cropping systems.
- Ability to access capital to invest in infrastructure, technology, and scale.
- Ability to navigate and manage risks, including climate variability, pest and disease pressure, and market fluctuations.
- Attracting and retaining skilled labour, particularly with subtropical horticulture expertise.
- Access to professional advice and technical support, including agronomy, pest management, and post-harvest handling.

- Effective pesticide and fungicide management, tailored to subtropical crop needs and regulatory requirements.
- Scalability of operations, allowing growers to expand production efficiently as demand and capability grow.

These factors will determine whether mango and papaya cultivation can become a commercially viable and sustainable aspect of Te Tai Tokerau-Northland's horticultural economy.

Sections 3.1.1 and 3.1.2 provide an overview of key stakeholder insights and market analysis in relation to cultivation feasibility.

3.1.1 Key Stakeholder Insights – Horticulturists

Stakeholders shared varying views as to the feasibility of sub-tropical crop cultivation in Te Tai Tokerau-Northland. Stakeholders noted that a warming climate is improving the feasibility of propagating and growing both mango and papaya crops, and that there is very strong consumer demand for locally sourced produce at farmers markets and boutique grocers. However, significant challenges remain in relation to the cost associated with growing produce, current yield sizes, and crop quality which limit the ability to scale up the industry. The key challenges and opportunities are outlined below.

3.1.1.1 Challenges

Capital Costs

One of the most significant challenges reported by growers is the high capital investment required for protected cropping infrastructure. Mango and papaya are highly sensitive to environmental stressors such as wind, heavy rainfall, and temperature fluctuations, making open-field cultivation unreliable. As a result, successful production depends on the use of covered systems, such as greenhouses or tunnel houses, which pose a significant capital cost. This cost is partially due to the geographic isolation, which makes the purchase and installation of covered cropping infrastructure logistically difficult due to increased transportation and labour costs.

The capital costs associated with covered cropping infrastructure for mango or papaya production are a barrier to entry and increase the opportunity costs of cultivating mango or papaya. This infrastructure is essential, not only for protecting the plants, but also to enable consistent yields and fruit quality.

Labour Capability and Cost

Labour capability and wages have been identified as key constraints to the growth of mango and papaya cultivation in Te Tai Tokerau-Northland. These crops require intensive, hands-on management, from pruning and stock care to harvesting and post-harvest handling, especially during this early, experimental phase of the industry. While general labour needs are not drastically different from other horticultural operations and many skills are transferable, successful subtropical fruit production demands specialised knowledge that is not yet widespread in the current workforce.

Accessing such capability across the broader market remains difficult. Hiring or training staff with the necessary expertise adds significant cost, and for many small-scale growers, this presents a major barrier to scaling or improving productivity. Without targeted workforce development and pathways to affordable expertise, labour will remain a critical constraint on the industry's potential.

Yield Size and ‘B-grade’ Produce

Yields for mango and papaya are currently low and inconsistent, with growers estimating loss rates between 5-20 per cent, primarily due to variability in crop quality. These challenges are compounded by the difficulty in utilising ‘b-grade’ fruit, produce that does not meet premium market standards. At present, there are limited commercial pathways for upcycling this lower-grade fruit into value-added products such as juices, powders, or nutraceuticals, which results in lost revenue and increased waste. Developing processing infrastructure and market channels for b-grade fruit could significantly improve the overall feasibility of the industry by reducing waste and improving financial returns from each harvest.

Cultivar Selection

Cultivar selection is a critical determinant of the success of mango and papaya cultivation in Te Tai Tokerau-Northland, with specific traits such as skin thickness, yield potential, and resilience to local climate conditions playing a central role in crop performance. Stakeholders emphasised that not all varieties are suited to the region’s evolving environment, and selecting the right cultivars to grow is essential to achieving consistent yields and marketable crops. To address this, there is a strong need for structured field trials and gene tracking to identify and propagate the most suitable varieties. Additionally, growers highlighted the importance of adopting intensive cropping models, such as planting up to 1,000 trees per hectare to maximise productivity and land use efficiency. These approaches require coordinated research and investment but are seen as vital steps toward improving the commercial viability of sub-tropical crop production.

Premium Pricing

Given the combination of small yields and substantial capital and operating costs, growers must command a premium price for their mango and papaya crops to ensure financial viability. This makes it more challenging to secure contracts to supply major supermarket retailers with fresh produce, as they currently sell imported mango and papaya at a lower cost. As a result, growers are reliant on niche markets that value sustainability, provenance, and quality, where consumers are willing to pay more for locally grown, organic sub-tropical fruit.

New Zealand Good Agricultural Practices Certification

Achieving New Zealand Good Agricultural Practices (NZGAP) Certification is a key requirement for mango and papaya growers aiming to access commercial markets. This certification ensures compliance with stringent health, safety, and hygiene standards, which are critical for food safety and consumer confidence. However, for small-scale growers, meeting these standards represents an ongoing commitment of both time and financial resources.

Orchard Systems and Management

Establishing effective orchard systems for subtropical crops like mango and papaya remains a significant challenge in Te Tai Tokerau-Northland. Growers report difficulty accessing accurate, transparent information on best-practice orchard design and management techniques suited to local conditions. This is compounded by the limited availability of region-specific research.

Further, managing fungal diseases also represents a challenge for growers. Effective disease management is deeply intertwined with orchard system management, such as irrigation practices, canopy management, and soil health, all areas where region-specific guidance is scarce.

3.1.1.2 Opportunities

Broader Industry Collaboration and Support

Stakeholders considered industry collaboration as a key determinant of the future success of the feasibility for mango and papaya cultivation in the Te Tai Tokerau-Northland. Growers are time-poor and have limited resources to form partnerships with research institutions, regional economic development agencies, and others to progress research, access funding, and advocate for necessary infrastructure. Growers expressed a clear need for more proactive and targeted support from institutions, such as Northland Inc, who have a role in supporting growers.

The Strength of the New Zealand Grown Story

New Zealand-grown mango and papaya are unlikely to compete with imported products on volume or price, and instead, must differentiate through branding and storytelling. Marketing the sustainability, local provenance, and artisanal quality of locally grown produce will help position Te Tai Tokerau-Northland grown crops as premium within the domestic market. This values-based marketing approach could appeal to consumers conscious of organic produce, as well as high-end retailers and restaurants who want to promote organic and locally sourced products. Some growers have demonstrated success with this already, particularly those supplying local farmers markets and restaurants.

Development of Unique Cultivars

In addition to growing established mango or papaya cultivars, New Zealand growers have a unique opportunity to cultivate and crossbreed unique strains of mango or papaya that are best suited to local conditions and consumer preferences. Stakeholders noted that New Zealand-grown mango and papayas may exhibit improved nutrient density, due to the relatively longer maturation period in the region's climate. Rather than competing on volume or price, the potential strategic advantage of New Zealand grown sub-tropical fruit lies in identifying and promoting a unique and premium crop.

3.1.2 Market Scan - Horticulturalists

Similar industries in other countries have been reviewed to ascertain the relevant success factors. By examining cultivation techniques and market strategies abroad, a better foundation may be established for the emerging New Zealand mango or papaya industry. These findings can be adapted for New Zealand's unique market dynamics and value proposition.

3.1.2.1 Mango Production in Australia

Australia is a major global producer of mangoes, with the bulk of commercial cultivation concentrated in Queensland and the Northern Territory, where the tropical and subtropical climates are ideal for mango growth. These regions support both traditional and high-density planting systems, which vary significantly in productivity. Under optimal conditions, high-density mango orchards can yield up to 20 tonnes per hectare[4], while more conservative estimates suggest yields of around 12 tonnes per hectare in well-managed environments. In less favourable conditions, such as areas with inconsistent rainfall or poor soil, yields may drop to approximately seven tonnes per hectare.[5]

[4] Asis, C. A., Tilbrook, J., Anson, D., Niscioli, A., Guinto, D., Bristow, M., & Rowlings, D. (2025). Nitrogen Level Impacting Fruit Yield and Quality of Mango in NorthernTropical Australia. Sustainability, 17(1), 80. https://doi.org/10.3390/su17010080
[5] Hort Innovation. (2017). Mango strategic investment plan: 2017–2021. Horticulture Innovation Australia Limited. https://www.horticulture.com.au

The success of mango cultivation in Australia is closely tied to climate management, particularly in relation to humidity and rainfall. One of the key challenges growers face is anthracnose, a fungal disease that thrives in moist conditions. If mango leaves become wet during critical growth stages, the fungus can infect the tree, causing it to abort developing fruit. This makes canopy management, timely fungicide application, and irrigation control essential components of orchard management. Australian growers often use integrated disease management strategies to mitigate these risks and maintain consistent fruit quality and yield.

The size and scale of the industry in the Northern Territory has allowed for a number of different cultivars to be grown with varying characteristics and purposes. The R2E2 variety for example, is highly sought after in export markets, due to its attractive red blush appearance, mild sweet flavour and excellent shelf-life.[6] In contrast, the Kensington Pride variety, a rich and sweet mango, is popular in domestic markets in Australia. However, due to its softer flesh and reduced shelf life, it is less suitable for international export.[6]

Key Insight for the New Zealand Market:

Crop management and climate control is particularly relevant for New Zealand, where growing conditions are not consistently optimal for sub-tropical fruit production. The variation in yield under different environmental conditions highlights the need for investigation and investment in replicating optimal growing environments, such as through greenhouses, hothouses, or protected cropping systems.

3.1.2.2 Papaya Production in Spain

In Europe, papaya cultivation has gained momentum, particularly in Southeast Spain where growers are successfully growing papaya in covered outdoor systems and greenhouses. These protected structures help mitigate the region's climatic challenges, such as cold winters and intense summer heat, enabling consistent production in a non-tropical setting. As of recent reports, there are over 100 hectares of papaya plantations under covered cropping in Spain, reflecting interest and investment in the crop.

Under optimal management, annual papaya yields can reach up to 200 tonnes per hectare (two harvests per annum), rivalling those of tropical countries. This high productivity, combined with effective pest and disease control (notably the absence of Papaya Ring Spot Virus in the region), positions Spanish-grown papaya as high-quality crop. The ability to ripen fruit on the tree further enhances sweetness and market appeal, making it well-suited for European consumer preferences.[7]

[6] Varieties, Tou's Garden: https://tousgarden.com.au/mango-varieties/
[7] Hueso, J.J., Salinas, I., Pinillos, V. and Cuevas, J. (2019). Papaya greenhouse cultivation in south-east Spain. Acta Hortic. 1250, 1-6 DOI: 10.17660/ActaHortic.2019.1250.1 https://doi.org/10.17660/ActaHortic.2019.1250.1

Key Insight for the New Zealand Market:

The success of papaya cultivation in Southeast Spain demonstrates that tropical crops can be grown productively in non-tropical climates, when supported by the appropriate infrastructure. This is highly relevant to Te Tai Tokerau-Northland, where the climate is also sub-optimal, although in a different way. Unlike Spain's hot and dry Mediterranean conditions, Te Tai Tokerau-Northland experiences an oceanic climate characterised by greater variability, higher humidity, and frequent wind. These factors present unique challenges for subtropical horticulture, particularly in maintaining consistent growing conditions.

The Spanish example highlights the critical role of temperature and climate control infrastructure, such as protected cropping systems, in replicating optimal growing environments. For Te Tai Tokerau-Northland, adapting these technologies to suit local conditions will be essential to maximise yield and product quality, and to build resilience against climatic fluctuations.

3.1.2.3 The Kiwifruit Industry in New Zealand

New Zealand's kiwifruit industry is a global exemplar of how strong co-ordination, innovation, and strategic branding can transform a niche crop into a premium export. Central to this success is Zespri International Limited, the marketing organisation established to manage the global sales and branding of New Zealand-grown kiwifruit.[8]

The Zespri Model – A Blueprint for Emerging Fruit Sectors

New Zealand's kiwifruit industry has achieved remarkable global success, largely due to the Zespri model, a grower-owned, cooperative marketing system that has transformed kiwifruit into a premium international product. Zespri acts as the single global marketer for New Zealand-grown kiwifruit, enabling consistent branding, quality control, and strategic market access. This unified approach has allowed the industry to avoid internal competition, stabilise prices, and build a strong global identity around New Zealand kiwifruit.

Zespri's achievements are underpinned by a strong foundation in horticultural science and market research. The development of proprietary cultivars like SunGold, offering superior taste, longer shelf life, and strong consumer appeal, has helped differentiate New Zealand kiwifruit in competitive markets. Alongside product innovation, the industry has invested in sustainability and labour solutions, enhancing its reputation and resilience. These efforts have enabled the industry reach significant scale, achieving a global operating revenue of NZD $5.14 billion in FY25.[8]

However, the success of the Zespri model did not happen overnight. It is the result of decades of coordinated effort, investment in research, and a commitment to long-term strategy.

Key Insight for the New Zealand Market:

Zespri's cultivar innovation and approach to marketing have enabled New Zealand kiwifruit to achieve both domestic and global recognition. The development of proprietary mango and papaya cultivars tailored, and a strong marketing campaign to promote the uniqueness of New Zealand crops, will be important in positioning these products as high value in both domestic and export markets.

[8] Zespri exceeds $5 billion in global sales in 2024/25 Financial Results (2025), Zespri.com Zespri exceeds $5 billion in global sales in 2024/25 https://www.zespri.com/en-NZ/publications/newsroomdetail/2024-25-financial-results

3.1.3 Summary of Feasibility for Horticulturalists

The cultivation of mango or papaya in Te Tai Tokerau-Northland is feasible, but not yet scalable. Investment, research and collaboration with horticulturalists is required to enable industry development. Challenges remain in climate suitability, cultivation costs, labour availability and grower regulation. However, there is a genuine opportunity to scale the industry to where yields are sufficient, and local produce is in demand in domestic and international markets for its sustainable practices and unique nutrient and taste profile.

3.2 Value-add Producers

If the mango or papaya industry is to develop in Te Tai Tokerau-Northland, the exploration of potential value-add product opportunities will become increasingly important. While it is not yet known whether these products will generate increased returns as opposed to fresh fruit sales, they provide access to different geographical and product markets. Value-add food processing also provides effective uses for by-products, reducing waste. Feasibility is determined by several factors, including:

- Reliable supply of high-quality produce from growers.
- Understanding of consumer product preferences and the commercial viability of producing different product types.
- Availability of infrastructure for processing and manufacturing, to support scalable and cost-effective operations.
- Collaborative research and development across the value chain, particularly with growers, research institutions, and regional development agencies.

Together, these elements will determine whether a sub-tropical manufacturing and processing facility is feasible.

Sections 3.2.1 and 3.2.2 provide an overview of key stakeholder insights and market analysis in relation to the viability of value-add production.

3.2.1 Key Stakeholder Insights – Value-add Producers

Throughout consultation, stakeholders provided transparent feedback in relation to the practical realities of constructing a processing facility in Te Tai Tokerau-Northland. While several key challenges were raised, stakeholders shared a highly positive collective outlook of the benefits that a local processing facility could offer Te Tai Tokerau-Northland, particularly for papaya-based products.

3.2.1.1 Challenges

Investment in Research and Development

Stakeholders emphasised the critical need for sustained investment in research and development (R&D) in areas such as processing techniques, product development, product benefits, and cultivar enhancement, noting that it is essential to create a competitive mango or papaya industry. Some stakeholders expressed the view that growing trials and value-added product development is being undertaken in isolation and is significantly underfunded, and that without coordinated and well-resourced research initiatives, the mango or papaya industries will struggle to scale at pace.

Investment in Processing Infrastructure

A major barrier to scaling value-add opportunities in the mango and papaya sector is the lack of existing processing infrastructure in Te Tai Tokerau-Northland, and the high cost to develop this infrastructure. While the potential for value-add products is recognised, the absence of facilities such as freeze dryers, storage units and extraction equipment present a significant challenge. The issue is particularly relevant for small to medium sized growers, who lack the scale to justify individual investment into processing infrastructure. It was noted during stakeholder consultations that the nearest freeze-dryer to Te Tai Tokerau-Northland is currently near Auckland Airport. Users must drive down, stay over-night, and return with the processed product the next day, which presents a significant logistical and financial burden. Without accessible, regional facilities, growers face increased costs, reduced efficiency, and limited ability to commercialise surplus or cosmetically imperfect fruit.

Supply Chain Dynamics

Establishing a reliable supply chain in Te Tai Tokerau-Northland could present several start-up challenges for value-add producers. Developing a processing facility is only one part of the equation, success also depends on having the necessary infrastructure in place, such as efficient transport links, reliable freight services, and temperature-controlled logistics, to support consistent market access and maintain product quality. For perishable subtropical crops like mango and papaya, logistic delays can quickly compromise quality and reduce market value.

3.2.1.2 Opportunities

Stepped Extraction Processes

Advanced processing methods were identified as a key area of potential for enhancing the value of mango or papaya crops. Techniques such as stepped extraction, where multiple ingredients are derived from different parts of the crop, can significantly increase the economic return from each harvest. For example, papayas can be broken into several different components and by-products, offering distinct commercial applications. Papaya leaves are being explored for medicinal applications like dengue treatment, peels can be processed into fibre-rich supplements, seeds are used in edible oils and cosmetics, and papain enzyme is widely applied in pharmaceuticals, food, and skincare.

This stepped processing and extraction model, ensures that value is extracted from more of the papaya, reducing waste. It also provides an opportunity to utilise papayas that are of insufficient quality for fresh produce sale, further reducing waste and increasing the overall profitability of harvests.

High-Value Ingredient Application

There is growing interest in the development of high-value applications for mango and papaya, particularly within the health and wellness sector. Functional foods, nutraceuticals, and cosmeceuticals derived from extracts are seen as promising avenues for both domestic and export markets. Extracts from papaya, such as enzymes, antioxidants, and bioactive compounds, are being investigated for their potential benefits in digestion, skin health, and immune support. The development of these products using locally grown crops has a high commercial potential. To realise these benefits, significant investment into R&D, product development and marketing would be required, particularly if these products are to be exported to international markets.

Shared Processing Infrastructure

Shared infrastructure models were frequently cited by stakeholders as a practical and inclusive solution to reduce barriers to entry for small-scale value-add product producers. Facilities such as Ngāwhā Innovation and Enterprise Park was highlighted as a particular opportunity. Stakeholders highlighted that a large proportion of key processing infrastructure is applicable across multiple different crop types, with few processes requiring specialist equipment. This infrastructure, available for broad use, provides opportunity for co-manufacturing. Shared access to essential processing equipment, such as temperature-controlled storage, extraction systems, and packaging lines, without the need for large upfront capital investment, would not only lower individual financial risk but also foster collaboration, knowledge exchange, and innovation across the sector.

Collaboration

Stakeholders strongly advocated for improved collaboration across the value-chain, linking growers, researchers, entrepreneurs, and industry bodies, to accelerate growth and build a more connected and adaptable sector. By sharing knowledge, resources, and expertise, the industry can unlock step-change growth, drive product development, and strengthen market positioning.

3.2.2 Market Scan - Value-add Producers

To support the development of a resilient and commercially viable mango or papaya industry in Te Tai Tokerau-Northland, it is essential to investigate value-added processing opportunities. This market scan provides case studies of how industries in other countries have successfully diversified into high-value products, unlocking new markets and improving industry financial sustainability.

3.2.2.1 Global Value-add Production of Mango

As outlined in Table 5, Mexico, Thailand, Brazil, India and the Philippines have successfully developed value-add product industries using locally grown mangoes as inputs.

Table 5: Global Successes in Value-add Production of Mango[9]

Country	Export Value of Value-Added Mango Products ($NZD)	Success Factors
India	$685 million	India, despite being the world's largest mango producer, has traditionally focused on pulp exports, especially from varieties like Totapuri and Alphonso. However, the country is now expanding into segments such as freeze-dried mango and individually quick-frozen cubes.
Mexico	$625 million	Value-add production includes dried mango slices, mango puree, and frozen mango cubes, successfully utilising cultivars such as Ataulfo. Mexico's strong cold chain infrastructure and traceability systems support its exports to North America and Europe, making it a benchmark for quality and consistency.

[9] C. Navamani, et.al (2024). Global Best Practices in Value-Added Mango Products: A Comparative Study with Strategic Insights for India's Export Potentiality, Educational Administration: Theory and Practice, 30(11) 2273-2281 Doi: 10.53555/kuey.v30i11.10413

Country	Export Value of Value-Added Mango Products ($NZD)	Success Factors
Thailand	$600 million	Thailand has carved a niche in the global market with its innovative 'mango snacks'. These include freeze-dried mango, chewy mango strips, and mango rice crackers, which appeal to health-conscious consumers. Thailand's success is underpinned by its emphasis on attractive retail packaging and product innovation.
Brazil	$530 million	Brazil's mango value-added product strategy focuses on freshly squeezed juices and mango pulp, which are exported for industrial use in beverages and desserts. The country is also investigating niche product segments like mango wine and vinegar, supported by Agri-industrial parks and advanced packaging technologies.
The Philippines	$454 million	The Philippines is renowned for its dried mango strips, which are a flagship export product. It also produces mango kernel oil for use in cosmetics and wellness products, and a range of mango-based confectionery such as candies, jams, and spreads. The country's ability to blend traditional knowledge with modern retail strategies has helped it maintain a strong presence in global markets.

Key Insight for the New Zealand Market:

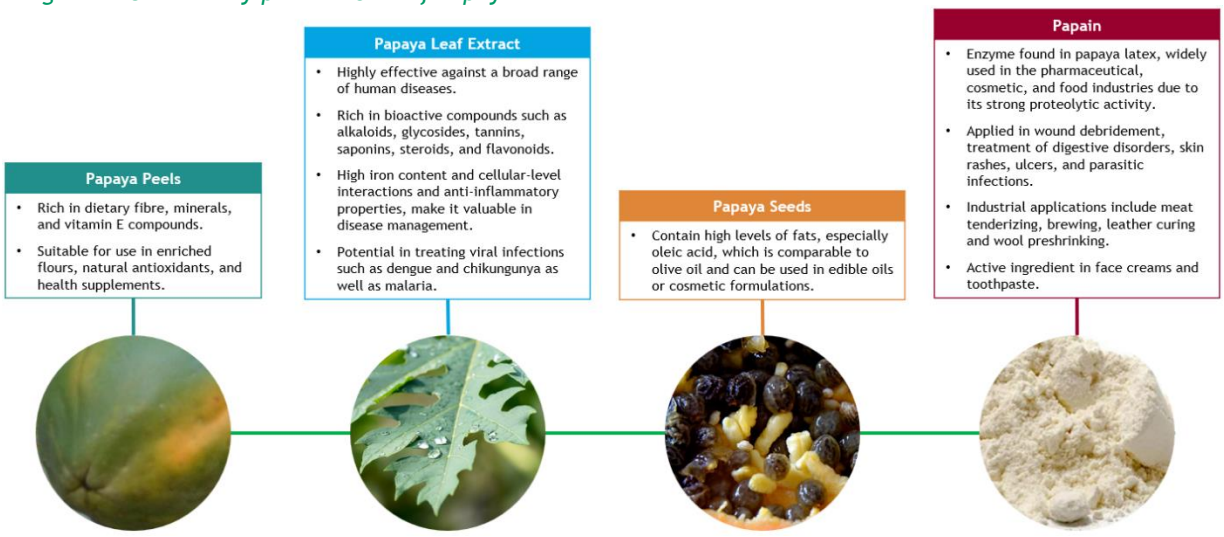
The international examples above demonstrate how value-add manufacturing, such as drying, pulping, and functional food production can enhance the commercial viability of mango cultivation. Countries such as Mexico, Thailand, and Brazil have successfully built premium product lines by leveraging infrastructure and innovation. For the Te Tai Tokerau-Northland based industry, this reinforces the opportunity to develop a high-value mango sector not reliant on just fresh fruit supply, but also shelf-stable products (as investigated in Chapter 4).

3.2.2.2 Use of Papaya By-products in Value-add Production

Research has identified that papaya has immense value-added product uses and potential. Papaya processing generates a significant amount of organic waste, particularly from peels and seeds, which can make up nearly half of the fruit's total mass.[10] These derivative products are increasingly recognised for their nutritional and functional value, offering opportunities for sustainable reuse across food, cosmetic, and pharmaceutical industries. In particular, the Papain enzyme derived from papaya latex, is a highly versatile and valuable component of the crop. Some of the key uses for papaya by-products are highlighted in Figure 7, below.

[10] Vinha, A. F. et al (2024). High-Value Compounds in Papaya By-Products (Carica papaya L. var. Formosa and Aliança): Potential Sustainable Use and Exploitation. Plants, 13(7), 1009. https://doi.org/10.3390/plants13071009

Figure 7: Common By-product Uses of Papaya [10]



Key Insight for the New Zealand Market:

The diverse uses of papaya by-products, such as peels, seeds and leaves, highlight a significant opportunity for New Zealand to utilise the full papaya plant, not just the fruit. In Te Tai Tokerau-Northland, where scale is likely to remain limited, maximising the value of each crop through multi-use applications can improve profitability, reduce waste, and support sustainability goals.

3.2.2.3 Shared Processing Facilities in British Columbia

Shared-use food processing infrastructure models are implemented globally as a mechanism to lower prohibitive cost barriers associated with processing produce. Collaborative facilities offering drying, pulping, and temperature-controlled storage can support innovation, commercialisation, and regional economic development in the agri-food sector.[11] The British Columbia Food Hub Network in Canada, provides an example of how these models can aid in better commercialising small-scale food production.[12]

The British Columbia Food Hub Network - Fostering Growth and Innovation

The British Columbia Food Hub Network is an initiative launched in 2019 by the Government of British Columbia to strengthen the province's food and beverage processing sector. It comprises a network of ministry-funded, shared-use food hubs providing affordable access to commercial processing infrastructure, equipment, and services. These hubs are designed to help small and medium-sized enterprises scale up, innovate, and commercialise their products. The initiative is part of a broader strategy to enhance food security, support local businesses, and create jobs in the agri-food sector[12].

Each hub is developed in collaboration with local communities and industry stakeholders. This collaborative model ensures that the hubs are tailored to regional needs while fostering innovation and knowledge transfer. Facilities typically include processing equipment, washrooms, cleanup up areas, packaging and temperature-controlled storage facilities[11].

By improving access to infrastructure and technical resources, the network plays a critical role in enabling regional economic development and building a more resilient, innovative, and sustainable food system in British Columbia.

[11] Operations (n.d.), *Operations: https://foodhubs.ssfpa.net/sop-templates/*
[12] BC Food Hub Network (2025), Government of British Columbia: https://foodhubs.ssfpa.net/sop-templates/

Key Insight for the New Zealand Market:

A shared-use model in Te Tai Tokerau-Northland, leveraging the learnings from the British Columbia based facility, would allow for collective access to essential equipment such as temperature-controlled storage, extraction systems, and packaging lines. This approach is financially more tolerable for small-scale growers, reduces waste, and enables the production of value-added goods, making it a practical and scalable solution for New Zealand's emerging sub-tropical crop industry.

3.2.3 Summary of Feasibility for Value-Add Producers

There is immense potential to establish a mango or papaya value-add processing industry in Te Tai Tokerau-Northland. This industry has the potential to be self-sustaining and will also support local growers. However, realising the potential benefits and economic impacts is largely reliant on significant investment into value-add product research and development and the construction of processing infrastructure.

3.3 Consumers and Commercial Outlets

Understanding consumer demand and the required product standards of commercial outlets is key in determining the scale and potential buyers / end users of mango and papaya products that are grown in the region. The feasibility of developing a mango and papaya industry in Te Tai Tokerau-Northland, which has sufficient demand for products, is dependent on:

- Consistently being able to produce high quality product to justify a premium market position.
- Competitive pricing, which will influence the extent to which locally grown produce can compete with imported alternatives.
- Consumer preferences, which will shape demand for locally sourced, wellness-oriented products.

Sections 3.3.1 and 3.3.2 provide an overview of key stakeholder insights and market analysis in relation to consumer requirements and demand.

3.3.1 Key Stakeholder Insights – Consumers and Commercial Outlets

Stakeholders provided insight into the likelihood of growers being able to meet market expectations of mango and papaya products to be sold in both domestic and international markets. The key challenges and opportunities are outlined below.

3.3.1.1 Challenges

High-Quality Produce

A recurring theme across stakeholder discussions was the critical importance of producing a high-quality crop. Both growers and end users emphasised that taste, texture, and visual appeal are essential to ensure the successful sale of fresh fruit. Many of the mango and papaya crops that are currently imported to New Zealand meet these criteria as they have been refined over several generations. It will be important that growers and innovators work efficiently to improve the attributes of locally grown crops in order to meet or surpass the quality of imported produce, as the consistent provision of high-quality crops is imperative to secure large-scale buyers (e.g. supermarkets) of locally grown mango or papaya.

Market Price Competition

A further challenge lies in the intrinsic cost structure of producing mango and papaya in New Zealand. Compared to larger overseas markets, New Zealand growers operate at a much smaller scale and face significantly higher labour and input costs, resulting in a higher price point for locally grown crops. This limits competitiveness in mainstream retail channels, where price sensitivity is high and imported products often dominate. While there may be strong demand in premium outlets such as organic stores and farmers markets, where consumers are more willing to pay for local, high-quality produce, breaking into supermarket supply chains remains difficult. This is a structural and is largely unavoidable under current conditions.

3.3.1.2 Opportunities

Consumer Preferences

Stakeholders observed strong and growing consumer interest for sub-tropical fruit, particularly as dietary preferences shift toward wellness, natural nutrition, and products that are grown sustainably. Additionally, mango and papaya are increasingly being used as ingredients in health-focused products such as smoothies, juices, dried fruit snacks, and supplements. An opportunity exists for the establishment of a locally grown mango or papaya industry to meet, and benefit financially from, growing consumer demand for these products.

Locally Sourced Produce Opportunity

Stakeholders noted that premium supermarket outlets, such as Farro Fresh, have expressed general enthusiasm for sourcing locally grown sub-tropical produce, particularly when it aligns with New Zealand's sustainability values and offers a compelling story of provenance and freshness. This enthusiasm is mirrored in the hospitality sector, where high-end restaurants are already sourcing locally grown sub-tropical fruit to feature in seasonal menus and showcase regional identity. New Zealand retailers and chefs are actively seeking alternatives to imported produce, driven by consumer demand for traceable, high-quality products with a local story. This presents a significant opportunity for growers.

New Zealand's Competitive Advantage

As discussed, New Zealand's climate presents a unique competitive advantage for growing sub-tropical crops like mango or papaya, with cooler conditions allowing longer maturation periods that can produce fruit with superior flavour, sweetness and nutrition values. Leveraging this differentiation is essential for accessing premium domestic markets and opens up export opportunities for value-added products such as freeze-dried fruit, papaya leaf extract, and tropical supplements.

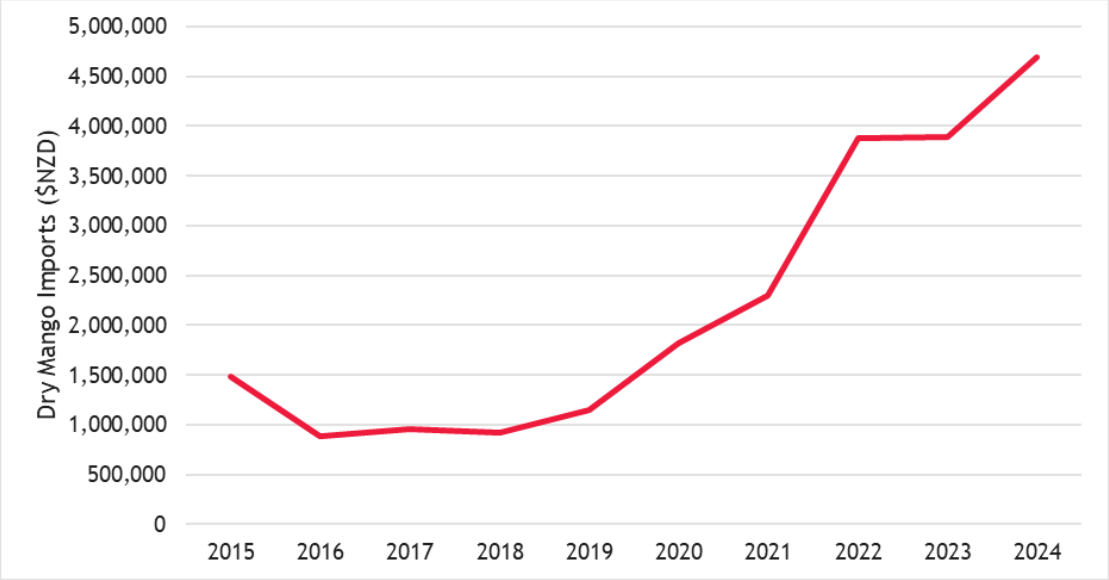
3.3.2 Market Scan – Consumers and Commercial Outlets

To assess the viability of locally grown mango and papaya being purchased in New Zealand, it is essential to understand current market dynamics, including import statistics and retail product pricing. The analysis in this section identifies New Zealand's mango and papaya import volumes, the retail value of fresh and value-added products, and the implications for the establishment of a domestic mango or papaya industry.

3.3.2.1 New Zealand Mango and Papaya Imports

There is a strong and growing market for dried mango in New Zealand. Import data from 2015 to 2024, summarised in Figure 8, shows that the market has expanded significantly since 2019, from just over $1.1 million to nearly $4.7 million in 2025[13]. This growth has been driven entirely by increased import volumes, indicating robust and rising consumer demand for dried mango products.

Figure 8: Value of Dried Mango Imports 2015 - 2024[13]



Source: Statistics New Zealand

Import data on frozen papaya suggests there is some local demand for processed papaya in New Zealand. While the data is sparse, with several years showing no imports, there has been a noticeable shift since the September quarter of 2023, when imports resumed. In 2024, New Zealand imported 4,766 units of frozen papaya, valued at $13,132[13]. Although the market remains small, this activity indicates emerging demand and highlights potential for a locally grown, high-value crop to meet niche consumer and processing needs.

3.3.2.2 New Zealand Mango and Papaya Product Prices

In addition to fresh whole fruit sales, there are a number of readily available commodity products on the market. Value-added products such as dried mango, mango pulp, and frozen mango are commonly bought at the supermarket or through wellness stores. Other non-food products, such as mango body products are also popular, and are available in supermarkets, pharmacies and specialty health and beauty stores.

While value-added products offer opportunities to diversify and access different market segments, they may not always generate higher returns than fresh fruit. However, they are often produced for strategic reasons, such as utilising b-grade fruit that is unsuitable for fresh sale, reducing waste, or reaching additional markets when the fresh fruit supply exceeds demand.

Table 6 outlines the average retail prices of several popular mango value-add commodities at New Zealand's primary supermarket chains.

[13] Statistics New Zealand

Table 6: Average Retail Prices of Mango-based Commodities in 2025[14,15]

	Per Quantity	Average Price ($NZD)
Mango Pulp	1kg	8.22
Frozen Mango	1kg	13.53
Dried Mango	1kg	37.35
Canned mango	1kg	4.29
Powdered Mango	1kg	174.40
Mango Body Butter	200ml	49.00
Mango Body Scrub	300ml	32.00

In terms of papaya products, the value appears to be optimised in shelf stable applications, such as dried and powdered. These products are commonly found in supermarkets and online wellness retailers, as well as being used as ingredients in commodity products such as nutraceuticals and skin care. Table 7 outlines the average retail prices of papaya-based products at New Zealand's primary supermarket chains and as discussed with Stakeholders. Of particular note is the pure papain enzyme, which retails for up to $8,000 per kilogram[16].

Table 7: Average Retail Prices of Papaya-based Commodities in 2025[12,14,15]

	Per Quantity	Average Price ($NZD)
Dried Papaya	1kg	19.70
Powdered Paya	1kg	299.50
Papaya Enzyme Masque	50ml	69.00
Scrub with Papaya Enzyme	120ml	53.00
Papaya Topical Ointment	200g	54.00
Pure Papain Enzyme	1kg	8,000.00

[14] New World (2025), https://www.newworld.co.nz/
[15] Woolworths(2025), https://www.woolworths.co.nz/
[16] Pure Science, https://purescience.co.nz/products/papain

Key Insight for the New Zealand Market:

Value-added products, utilising mango and papaya as inputs, are already being sold in New Zealand. These products tend to command significantly higher prices compared to the sale of fresh fruit. To ensure a mango or papaya industry in Te Tai Tokerau-Northland is financially sustainable, value-add opportunities must be investigated.

3.3.3 Summary of Consumer Feasibility

Consumer preferences continue to shift toward wellness-oriented and sustainably sourced foods, such as locally grown mango or papaya. The analysis has highlighted that if growers are able to produce crops that are of high quality in taste and appearance, as well as at a reasonable price point, there is an untapped consumer demand in the domestic market as well as potential international export markets.

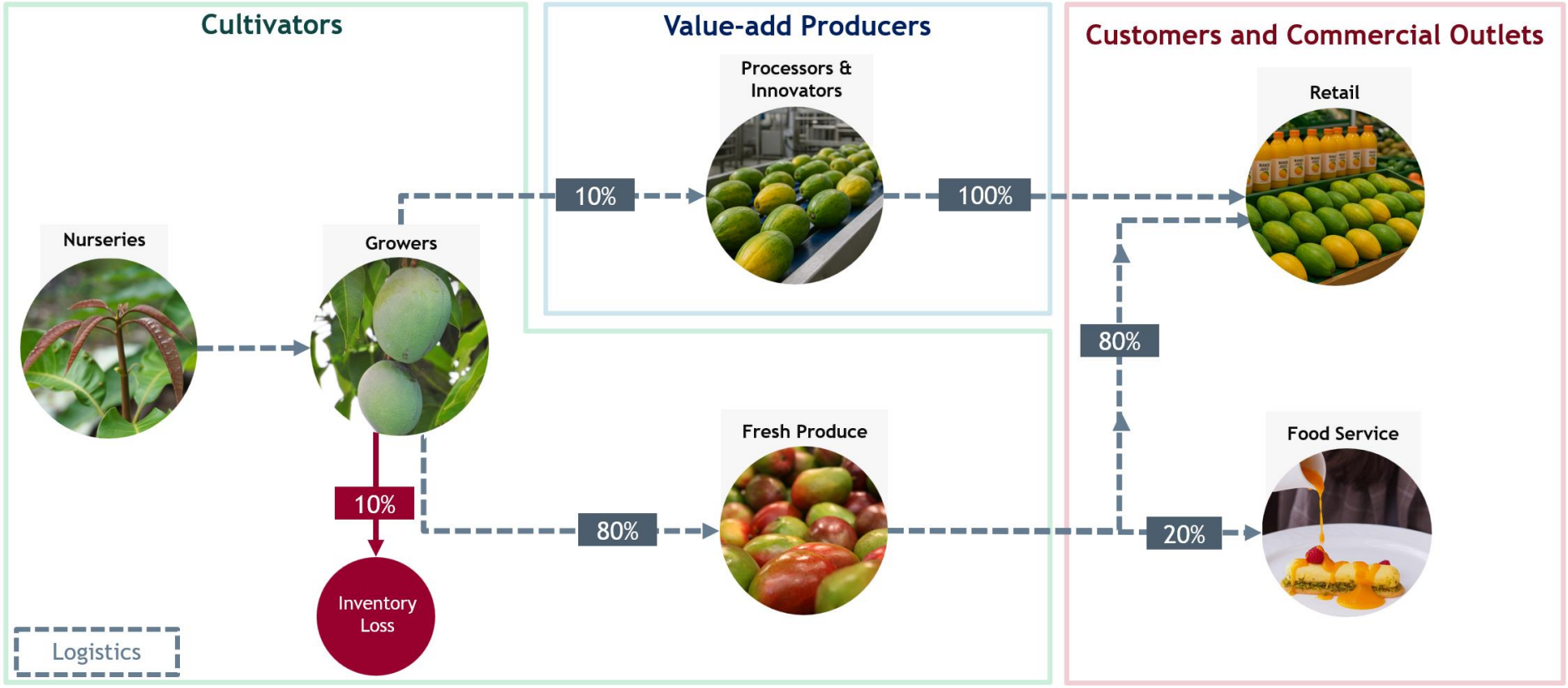
4 Economic Analysis

4.1 A Vision of the Potential Future Industry

As detailed across Chapters 1 – 3, the mango and papaya industries are currently in their infancy but have the potential to develop. This Chapter includes an assessment of a hypothetical mature mango or papaya industry in Te Tai Tokerau-Northland, where 20 hectares of land is utilised for mango or papaya growing, and includes the required infrastructure for growing (e.g. covered cropping infrastructure).

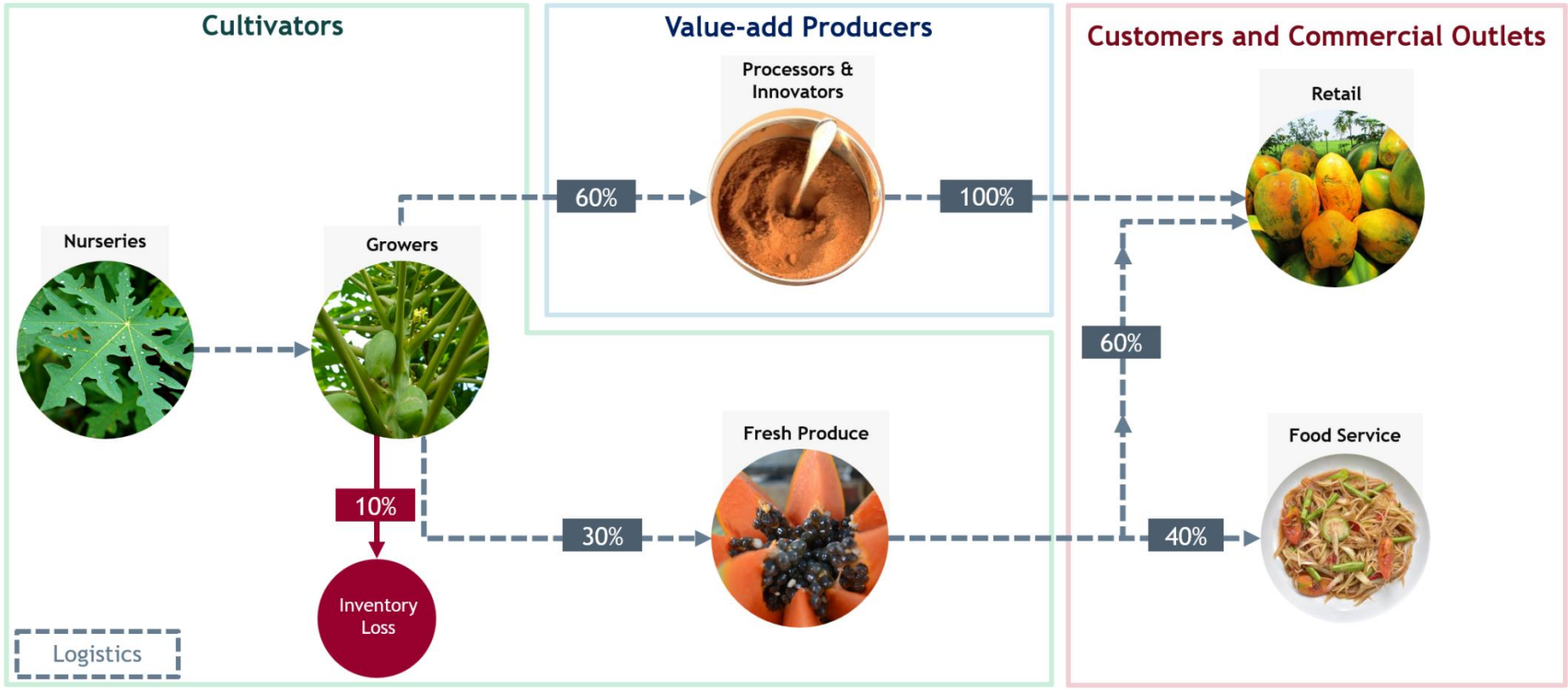
To inform the economic analysis, a future state indicative supply chain for mango or papaya industries has been developed in consultation with stakeholders, and is illustrated in Figure 9 and Figure 10. It should be noted that while stakeholders expressed differing views in relation to the future state of each industry, the scenarios presented represent a collective view.

Figure 9: Potential Mango Supply Chain in Future State



*Note: The intention of this supply chain is to be a high-level illustration. In reality, the supply chain is more complex than what is shown in this figure.

Figure 10: Potential Papaya Supply Chain in Future State



*Note: The intention of this supply chain is to be a high-level illustration. In reality, the supply chain is more complex than what is shown in this figure.

The two scenarios assessed in the economic analysis include:

Scenario 1: Mango Industry – Future State

The economic analysis is focused on the first two stages of the industry supply chain shown in Figure 9: mango cultivation and value-add producers. As informed through consultation, for a typical mango orchard it could be expected that ten per cent of crop is lost to disease, pests, weather, and other factors. It should be noted that this is relatively low, due to stakeholder feedback that plant maintenance and care is prioritised for maximum yield. The remaining yield could plausibly be split as follows:

- 80 per cent for sale as fresh fruit. This could be at farm-gate, online, local farmers markets, or sale to distributors and on to retailers.
- 10 per cent sent on to further stages of processing into high value manufactured goods.

Scenario 2: Papaya Industry – Future State

The economic analysis is focused on the first two stages of the industry supply chain shown in Figure 10: papaya cultivation and value-add producers. For a typical papaya orchard, stakeholders informed us that relative to the mango industry, there would be a higher focus on high value manufacturing because of its natural properties (e.g. enzyme in papaya, papain). The economic model assumes that around ten per cent of crop is lost to disease and pests. It should be noted that this is relatively low, due to stakeholder feedback that plant maintenance and care is prioritised for maximum yield. The remaining crop is split as follows:

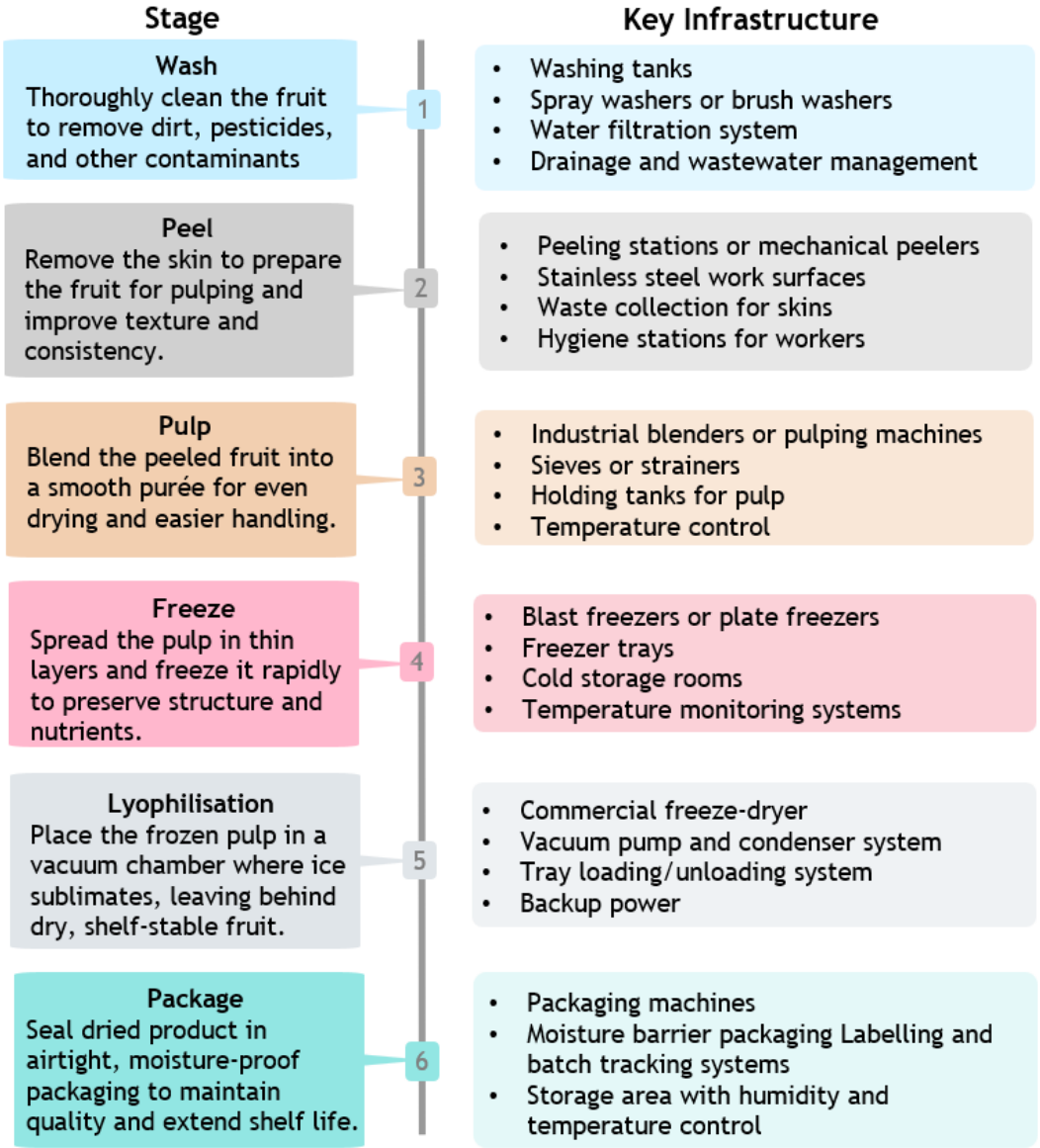
- 30 per cent for sale as fresh fruit. This could be at farm-gate, online, local farmers markets, or sale to distributors and on to retailers.
- 60 per cent sent on to further stages of processing into high value manufactured goods.

Both scenarios imagine a future state where there is sufficient manufacturing capacity and capability to support either mango or papaya freeze drying. However, it should be noted that processing and freeze-drying fruit is not a straightforward process and requires significant investment.

Process of Freeze-Drying Fruit

Establishing a small-scale, independent production line involves more than simply acquiring a freeze-dryer; it requires a coordinated setup of different infrastructure that supports each stage of the process. For growers investigating this pathway, each component of the production chain must be considered. These stages, ranging from washing and peeling to pulping, freezing, drying, and packaging, each have distinct technical and infrastructure requirements and cost implications. Although there are nuances between the physical composition of mango and papaya, (papaya containing a multitude of seeds, as opposed to mango comprising just one big pit) there general process of freeze-drying is similar. Figure 11 illustrates the key stages and equipment involved in freeze drying mango and papaya.

Figure 11: Freeze-Drying Process of Mango and Papaya[17, 18]



[17] What Does Mango Processessing Machine Include, Mango Process, https://www.mangoprocess.com/what-does-mango-processing-machine-include/
[18] Tropical Food, https://tropicalfood.net/en/

The remainder of this Chapter explores the potential economic impact of either establishing a mango or papaya industry, utilising 20 hectares of land.

4.2 Economic Assessment Approach

To evaluate the economic impact of the two scenarios: a mango industry or a papaya industry, a robust Input-Output (IO) modelling approach was taken.

IO models are widely used to assess the economic contribution of existing levels of economic activity and the economic impacts of new activity (called “shocks”). The models are based on IO tables that describe the interdependencies between industries within the regional economy and with the economy outside of Te Tai Tokerau-Northland. The tables are published by Statistics New Zealand and are considered official statistics. This robust data source and structure makes the comprehensive economic framework provided by the model useful for disentangling the direct and flow-on effects of activity in a regional economy. Generally, IO models are familiar to New Zealand policy and industry audiences.

Over the past decade, BDO has developed an extended IO model known as the RISE model. The RISE model is updated annually to reflect changes in the economy's structure.

The basic IO method used as a base for the RISE model has been extended to incorporate population and unemployment changes. Modelling population change allows for the estimation of impacts on population driven sectors, such as government administration, health, defence and education. Modelling unemployment change allows estimation of an offsetting effect on consumption-induced flow-on impacts as some new employees may have previously claimed unemployment benefits, and some may be new to Te Tai Tokerau-Northland. These extensions improve the reliability of RISE model estimates compared to conventional IO models.

A RISE model based on the 2020 year of the Te Tai Tokerau-Northland Region was used to make economic estimates of the impact. This is the last year for which appropriate data was available.

A scenario approach represents the market, and is indicative only

The scenario approach used in this analysis is hypothetical. Every farm and every factory are different and will face different costs and revenue models. While costs and revenue figures estimated are robust and have been tested with stakeholders, the purpose of the data is to inform the economic modelling, rather than inform potential growers or manufacturers.

It is important to note that the outcomes presented in this economic analysis are hypothetical and indicative only. Each scenario assesses the entire market based on a modelled scenario of a 20-hectare operation. Actual results may vary between individual growers and value-add producers due to differences in site conditions, management practices, cultivar selection, and infrastructure.

4.3 Scenario Definitions

During consultation with stakeholders and the market scan, it was learned that, while there are many potential value-add products that use either mango or papaya as their inputs, production costs vary significantly by product.

Consider the case of mango seed/flesh being processed to extract beneficial oils and enzymes used in moisturising hand cream. To realise the benefits of these compounds in these products requires importing or manufacturing humectants like glycerine, and thickeners like behenyl alcohol or stearic acid. These products are produced in New Zealand to varying degrees but are generally imported.

Some stakeholders held the view that (from their own research) freeze drying mango, or papaya represents a balance between adding value, without imposing excessive costs. As such, for the economic analysis in both scenarios, it has been assumed that all mango / papaya grown in New Zealand and allocated to value-add processing will be freeze dried and sold.

4.3.1 Scenario 1 - Mango Industry Established

The International Tropical Fruits Network estimates that there are around 100 hectares of land allocated to growing bananas in Te Tai Tokerau-Northland.[19] In Scenario 1, the establishment of a mango growing and processing industry, it has also been assumed that 20 hectares of land is allocated to growing mangoes. It has also been assumed that all crops are covered by greenhouses or hoop tunnels to prevent rain exposure as wet flowers can lead to the abortion of fruit. No calculation of the potential opportunity cost of growing mangoes has been developed.

International experience from Australia finds that yields of mangos can be up to 12 tonnes per hectare planted.[20] Although it is possible for mango plants to grow in New Zealand, the climate is not optimal for mango cultivation. This is particularly true for sweet, good for eating mango cultivars. As noted during consultation with stakeholders, mangos require a dry season, which Te Tai Tokerau-Northland does not generally have.

As such, an estimated yield of seven tonnes per hectare of mature mango trees has been assumed. This is a conservative estimate based on a middle ground between the 12 tonnes per hectare for mango grown in Australia (under a tropical climate), and the one tonne per hectare for mango grown outside in Te Tai Tokerau-Northland. This assumption has been informed by, and validated, with stakeholders.

As outlined above, it is assumed that ten per of crop is lost to disease, pests, weather, or other factors, 80 per cent of crop sold as fresh fruit, and the remaining ten per cent is developed into freeze dried mango powder to be exported. The assumed export price of New Zealand freeze dried mango is in line with the price of mango powder that is sold for use in overseas food products.

The assumptions for scenario 1, the establishment of a mango industry in Te Tai Tokerau-Northland, are outlined in Table 8.

[19] International Tropical Fruits Network, https://www.itfnet.org/v1/2023/08/new-zealand-far-north-ripe-for-financial-and-environmental-benefits-of-bananas/
[20] Hort Innovation. (2017). Mango strategic investment plan: 2017-2021. Horticulture Innovation Australia Limited. https://www.horticulture.com.au

Table 8: Mango Scenario Assumptions

Mango	Value	Unit	Source
General Assumptions			
Hectares planted	20	ha	BDO assumption
Production lost	10	%	Stakeholder input
Production to fresh fruit sale	80	%	Stakeholder input
Production to manufacturing	10	%	Stakeholder input
Cultivation Assumptions			
Mango grown and sold	112,000	kg	BDO analysis
Price per kg fresh	3.50	$ NZD	BDO assumption
Total revenue to growers	0.39	$million NZD	BDO analysis
Value-add Product Manufacturing Assumptions			
Mango grown and processed	14,000	kg	BDO analysis
Mango flesh yield	73	%	Rodriguez et al (2012)
Flesh to be freeze dried	10,150	kg	BDO analysis
Freeze dried mango yield	15	%	Malik et al (2017)
Export price of mango powder	34.44	$ NZD	BDO assumption
Total revenue to manufacturers	52,435	$ NZD	BDO analysis

4.3.2 Scenario 2 - Papaya Industry Established

The International Tropical Fruits Network estimates that there are around 100 hectares of land allocated to growing bananas in Te Tai Tokerau-Northland.[21] In Scenario 2, the establishment of a papaya growing and processing industry, it has also been assumed that 20 hectares of land is allocated to growing papayas. It has also been assumed that all crops are covered by greenhouses or hoop tunnels as papaya is a sub-tropical crop and does not tolerate cold weather. No calculation of the potential opportunity cost of growing papayas has been developed.

Compared to mango yields, papaya produces more per hectare. Studies of the yield of papayas grown in greenhouses, even in more basic greenhouses, are approximately 60 tonnes per hectare. Noting that Te Tai Tokerau-Northland's climate is not optimal for growing papayas, a conservative assumption has been made that papayas yields would be 40 tonnes per hectare. This assumption

[21] https://www.itfnet.org/v1/2023/08/new-zealand-far-north-ripe-for-financial-and-environmental-benefits-of-bananas/

was validated with stakeholders, who suggested that yields of papaya in Te Tai Tokerau-Northland can be as high as around 44 tonnes per hectare.

As outlined above, it is assumed that ten per of crop is lost to disease, pests, weather, or other factors, 30 per cent of crop sold as fresh fruit, and the remaining 60 per cent is developed into freeze dried papaya powder. Fresh papaya is likely to be served at hotel breakfast buffets or used at restaurants, attracting a premium price. The freeze-fried papaya powder is assumed to be exported to overseas manufacturers of nutraceuticals or topical products.

The assumptions for scenario 2, the establishment of a papaya industry in Te Tai Tokerau-Northland, are outlined in Table 9.

Table 9: Papaya Scenario Assumptions

Papaya	Value	Unit	Source
General Assumptions			
Hectares planted	20	ha	BDO assumption
Production lost	10	%	Stakeholder input
Production to fresh fruit sale	30	%	Stakeholder input
Production to manufacturing	60	%	Stakeholder input
Cultivation Assumptions			
Papaya grown and sold	240,000	kg	BDO analysis
Price per kg fresh	5.00	$ NZD	BDO assumption
Total revenue to growers	1.2	$million NZD	BDO analysis
Value-add Product Manufacturing Assumptions			
Papaya grown and processed	480,000	kg	BDO analysis
Papaya flesh yield	77	%	Kumar et al (2020)
Flesh to be freeze dried	369,600	kg	BDO analysis
Freeze dried papaya yield	10	%	Foodstruct (2025)
Export price of papaya powder	41.33	$ NZD	BDO assumption
Total revenue to manufacturers	1.53	$million NZD	BDO analysis

4.4 Economic Impact of Establishing a new Mango or Papaya Industry

In order to determine the likely economic impact of establishing a mango or papaya industry in Te Tai Tokerau-Northland, estimates relating to the likely revenues and operating expenses were made, and are outlined in Sections 4.4.1 and 0. This includes revenue and operating expenses forecasts for both horticulturalists and value-add product manufacturers.

To calculate the potential impacts of a mango or papaya sector in Te Tai Tokerau-Northland the RISE model framework (as described in Section 4.2) was employed. Key indicators assessed in economic modelling and detailed in section 0, include:

- **Economic impact:** Changes in economic activity are referred to as economic impacts. Generally, changes in economic activity indicators result from some stimulus or external shock imposed. In this analysis, the economic impact includes the increases in contributions to the economy stimulated by the income generated and operating expenditures made during the process of growing and freeze-drying mangos or papayas.
- **Gross Domestic Product (GDP)** - A measure of the contribution of an activity to the economy. GDP is measured as value of gross output (business revenue) less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as the sum of household income, gross operating surplus and gross mixed income net of payments to owner managers and taxes less subsidies on products and production. It represents payments to the primary inputs of production (labour, capital, and land). Using GDP as a measure of economic impact avoids the problem of double counting that may arise from using value of output for this purpose.
- **Full-time equivalent (FTE) employment -** A measure of the number of working proprietors, managers, directors, and other employees, in terms of the number of full-time equivalent (FTE) jobs. FTE is a way to measure a worker's involvement in a project. An FTE of 1.0 means that the person is equivalent to a full-time worker, while an FTE of 0.5 signals that the worker is half-time. In this report employment has been reported in terms of FTE units on a per annum basis.

This framework shows how each potential scenario (mango or papaya) can add value to the economy and benefit the people of Te Tai Tokerau-Northland.

The forecast impacts shown in section 4.4.3 are presented in terms of:

- Direct impact - The initial round of output, employment and GDP generated by an economic activity.
- Flow-on impact - The sum of production-induced effects and consumption-induced effects. Production-induced effects are additional output, employment and GDP resulting from spending by firms (e.g., electricity supply) that receive payments from the sale of goods and services to firms undertaking, (e.g., freight transportation services). Consumption-induced effects are additional output, employment and GDP resulting from re-spending by households that receive income from employment in direct and flow on activities.
- Total contribution - The sum of direct and flow-on contribution.

This breakdown shows how economic impacts are composed for each potential scenario, the establishment of a mango or papaya industry. For both Scenario 1 and Scenario 2, economic impact results are further segregated and displayed for both horticulturalists, value-add producers, and as an entire industry where it is assumed both local growers and value-add producers exist.

4.4.1 Revenue and Operating Expenses for Horticulturalists

4.4.1.1 Revenue

A Premium Product is the Minimum

The economic modelling presented in this section is built on scenarios that assume New Zealand grown mango and papaya can out-compete imported crops in both the fresh market, and the export market for freeze dried fruit. This implies the industry is focussed on producing the highest quality fruit and demonstrates the superiority of New Zealand grown fruit to international markets. New Zealand mangoes and papaya will not be able to compete as a commodity.

Mango

The assumed 20 hectares of mango planted in Te Tai Tokerau-Northland will produce an estimated 140,000 kilograms of mangos a year, once mature. Of this, ten per cent will be lost, and a further ten per cent will be processed into freeze dried mango. This leaves 112,000 kilograms of mango to be sold fresh to New Zealand consumers.

As outlined in Table 10, growers could receive around $3.50 per kilogram of mango sold, and the industry could generate $390,000 in revenue in a typical year. Examined in conjunction with the import data in Table 4, imports of mango to New Zealand are around $11 million each year. As such, a local mango industry with $390,000 in revenue each year appears achievable.

Table 10: Fresh Mango Revenue Assumptions

Mango revenue	
Hectares planted (ha)	20
Mango grown and sold (kg)	112,000
Price per kg ($)	3.50
Total revenue to growers ($m)	**0.39**

Papaya

The assumed 20 hectares of papaya planted in Te Tai Tokerau-Northland will produce an estimated 800,000 kilograms of papayas per year, once mature. Of this, ten per cent will be lost, and a further 60 per cent will be processed into freeze dried papaya. This leaves 240,000 kilograms of papaya to be sold fresh to New Zealand consumers.

As outlined in Table 11, growers could receive around $5 per kilogram of papaya, and the industry can expect to generate $1.2 million in revenue in a typical year. Compared to the current New Zealand imports of papaya valued at around $2 million (see Table 4) this is a large portion. However, it can be justified as the minimum entry requirement will be that New Zealand papayas are high quality, so consumer preferences shift towards locally grown papayas that are considered to be more desirable than imported fruit.

Table 11: Fresh Papaya Revenue Assumptions

Papaya revenue	
Hectares planted (ha)	20
Papaya grown and sold fresh (kg)	240,000
Price per kg ($)	5.00
Total revenue to growers ($m)	1.2

4.4.1.2 Operating Expenses

A scenario approach is indicative only

The scenario approach used in this analysis is hypothetical. Every orchard is different and will face different costs and revenue models. While costs and revenue figures estimated are robust and have been tested with stakeholders, the purpose of the data is to inform the economic modelling, rather than inform potential growers.

The operating costs of growing mango or papaya were also forecast using data provided by stakeholders, and New Zealand avocado industry data as a benchmark. It should be noted that the one-off capital costs associated with installing covered cropping infrastructure (i.e. green houses), which is expected to be required for both mango and papaya cultivation in Te Tai Tokerau-Northland, is excluded from economic modelling as the analysis is seeking to assess a hypothetical industry in a 'normal' year of operation.

The forecast total operating expenses for a mango orchard are shown in Table 12.

Table 12: Mango Orchard Operating Expenses

	$ Per hectare	Total costs ($) per 20 hectares
Fertiliser Costs	1,310	26,207
Mulch	621	12,426
Soil and leaf tests	166	3,329
Pest monitoring cost	143	2,855
Pesticide/fungicide cost	763	15,262
Phytophthora management cost	27	532
Herbicide and weed control cost	173	3,465
Mowing	139	2,778
Shelter maintenance	363	7,268
Pruning cost	800	15,997
Bee hives and pollination cost	438	8,768
Repairs, maintenance, and replacements	524	10,481
Electricity costs	334	6,687
Fuel and oil costs	820	16,394
Other orchard expenses	762	15,233
Other admin expenses	212	4,249
Water costs	353	7,065
Insurance costs	847	16,946
Consultants	341	6,823
Vehicles	601	12,029
Compliance and health & safety	2,057	41,131
Rates	492	9,833
Wages	6,724	134,482
Total	**19,012**	**380,240**

Table 13 outlines the estimated range of operating costs for 20 hectares of mango crop.

Table 13: Estimated Range of Operating Costs for 20 Hectares of Mango

	Low Range (-20%)	Mid-Range	High Range (+20%)
Total Cost	$304,192	$380,240	$456,288

Stakeholders explained that papaya plants grow lower and require less room between plants on an orchard, among other key differences. To account for these differences the operating costs for a hypothetical papaya orchard differ to a mango orchard. Table 14 summarises the operating expenses of a papaya orchard.

Compared to the modelled revenue, the costs of growing papayas are very low, indicating a potentially highly profitable industry. This is driven by assumptions around fruit quality and the ability of the industry to command a premium price for fresh fruit. Consistent with other primary sectors in New Zealand, the papaya industry in Te Tai Tokerau-Northland will need to be premium to have long term financial sustainability.

Table 14: Papaya Orchard Operating Expenses

	$ Per hectare	Total costs ($) per 20 hectares
Fertiliser Costs	1,310	26,207
Mulch	124	2,485
Soil and leaf tests	150	2,996
Pest monitoring cost	128	2,569
Pesticide/fungicide cost	687	13,735
Phytophthora management cost	24	479
Herbicide and weed control cost	156	3,118
Mowing	97	1,944
Shelter maintenance	363	7,268
Repairs, maintenance, and replacements	524	0
Electricity costs	334	0
Fuel and oil costs	656	10,481
Other orchard expenses	762	6,687
Other admin expenses	212	13,115
Water costs	353	15,232
Insurance costs	847	4,248
Consultants	341	7,064
Vehicles	481	16,945
Compliance and health & safety	1,440	28,791
Rates	492	9,832
Wages	3,655	73,090
Total	**13,137**	**262,740**

Table 15 outlines the estimated range of operating costs for 20 hectares of papaya crop.

Table 15: Estimated Range of Operating Costs for 20 Hectares of Papaya

	Low Range (-20%)	Mid-Range	High Range (+20%)
Total Cost	$210,192	**$262,740**	$315,288

4.4.2 Revenue and Operating Expenses for Value-Add Product Manufacturers

4.4.2.1 Revenue

Revenue assumptions of a freeze-dried mango processing industry were constructed using estimates of mango flesh yield, the yield of freeze-dried mango from mango flesh and a robust estimate of the price of freeze-dried mango powder. It was assumed that ten per cent of the total mango yield in Scenario 1 would be processed into freeze dried mango powder to be exported. As such, a freeze-dried mango sector could produce 1,522 kilograms of product in a typical year. Assuming this can be sold for $34.44 per kilo, the industry could generate $52,435 in a typical year. The forecast total revenue assumptions for a freeze-dried mango industry are shown in Table 16.

Table 16: Freeze dried mango revenue assumptions

Mango	Value	Source
Hectares planted (ha)	20	BDO assumption
Mango grown and processed (kg)	14,000	BDO analysis
Mango flesh (%)	73%	Rodriguez et al (2012)
Flesh to be freeze dried (kg)	10,150	BDO analysis
Freeze dried mango from fresh (%)	15%	Malik et al (2017)
Freeze dried mango yield (kg)	1,522	BDO analysis
Price of freeze-dried mango powder ($NZD)	34.44	BDO assumption - multiple sources
Total revenue of the industry ($NZD)	52,435	BDO analysis

Revenue assumptions of a freeze-dried papaya processing industry were constructed using estimates of papaya flesh yield, the yield of freeze-dried papaya from papaya flesh and a robust estimate of the price of freeze-dried papaya powder. It was assumed that 60 per cent of the total papaya yield in Scenario 2 would be processed into freeze dried papaya powder. As such, a freeze-dried papaya sector could produce 36,960 kilograms of product in a typical year. Assuming this can be sold for $41.33 per kilo, the industry could generate $1,527,483 in a typical year.

The forecast total revenue assumptions for a freeze-dried mango industry are shown in Table 17.

Table 17: Freeze dried papaya revenue assumptions

Papaya	Value	Source
Hectares planted (ha)	20	BDO assumption
Papaya grown and processed (kg)	480,000	BDO analysis
Papaya flesh (%)	77%	Kumar et al (2020)
Flesh to be freeze dried (kg)	369,600	BDO analysis
Freeze dried papaya from fresh (%)	10%	Foodstruct (2025)
Freeze dried papaya yield (kg)	36,960	BDO analysis
Price of freeze-dried papaya powder ($NZD)	41.33	BDO assumption - multiple sources
Total revenue of the industry ($NZD)	1,527,483	BDO analysis

4.4.2.2 Operating costs

A scenario approach is indicative only

The scenario approach used in this analysis is hypothetical. Every factory is different and will face different costs and revenue models. While costs and revenue figures estimated are robust and have been tested with stakeholders, the purpose of the data is to inform the economic modelling, rather than inform potential growers.

The operating costs of a freeze-dried mango industry were developed using inputs from the Food North Business Case. A calculation was made to attribute costs of the Ngawha food innovation hub to tonnes of fruit processed to form a robust estimate of the costs of freeze-drying mango in Te Tai Tokerau-Northland. In total, to process the 14,000 kilograms of mango flesh into 1,522 kilograms of freeze-dried mango, manufacturers might spend $24,301 in operating costs, as calculated in Table 18.

Table 18: Manufacturing costs of freeze-dried mango

Cost	Value ($)
Electricity	5,281
Water	1,112
Waste Water Treatment	221
Wages	4,740
Equipment lease cost - Rexmoi dryer ($5k pm x 10)	1,845
Waste management	221
Compliance Costs	1,107
Consumables	372
Maintenance costs	1,845
Routine lab testing	443
Marketing	7,111
Total costs	24,301

The operating costs of a freeze-dried papaya industry were developed using inputs from the Food North Business Case. A calculation was made to attribute costs of the Ngawha food innovation hub to tonnes of fruit processed to form a robust estimate of the costs of freeze-drying papaya in Te Tai Tokerau-Northland. In total, to process the 1,184,800 kilograms of mango flesh into 184,800 kilograms of freeze-dried papaya, manufacturers might spend $3,026,823 in operating costs, as shown in Table 19.

Table 19: Manufacturing Costs of Freeze-Dried Papaya

Cost	Value ($)
Electricity	192,297
Water	40,503
Waste Water Treatment	8,064
Wages	660,160
Equipment lease cost - Rexmoi dryer ($5k pm x 10)	67,200
Waste management	8,064
Compliance Costs	40,320
Consumables	13,541
Maintenance costs	67,200
Routine lab testing	16,144
Marketing	20,000
Total costs	1,133,493

It should be noted that the one-off capital costs associated with developing a food processing facility, which does not yet exist in Te Tai Tokerau-Northland on a commercial scale, is excluded from economic modelling as the funding party of this facility is yet to be determined.

4.4.3 Potential Economic impact

This section details the results of the economic impact modelling for the establishment of a local mango or papaya industry in Te Tai Tokerau-Northland.

4.4.3.1 Scenario 1 - Mango Industry Established

Mango Growing Industry

The potential economic impact of a mango growing industry is based on the modelling of 112,000 kilograms of mango being grown and sold in a typical year, and the associated costs of growing 20 hectares of mango under cover.

Summarised in Table 20, the economic modelling shows that this economic activity could generate $300,000 in GDP for Te Tai Tokerau-Northland, composed of $150,000 GDP directly, and $150,000 generated through flow on effects.

In term of employment, this mango growing sector could employ up to three FTEs directly, and one FTE through the flow on effect of workers spending their wages in the local economy.

Mango Freeze-Drying Industry

A mango freeze drying industry could process 10,150 kilograms of mango flesh into 1,523 kilograms of freeze-dried mango to be exported for a total value of $52,435 to the regional economy each year. This activity would incur $24,300 in operating costs.

As summarised in Table 20, altogether this economic activity could generate $50,000 for Te Tai Tokerau-Northland, composed of $300,000 direct GDP, and $10,000 generated by flow on effects. For this volume of economic activity, a total of one FTE employment would be generated.

Total Mango Industry

Cumulatively, a future mango industry in Te Tai Tokerau-Northland could generate up to $180,000 GDP directly in a typical year, plus a further $160,000 GDP through flow on effects, for a total contribution of $340,000 to the region's GDP. A more detailed breakdown is shown in Table 20. The development of a 20-hectare mango growing industry plus associated manufacturing industry is also expected to increase employment, resulting in the creation of five new FTEs in Te Tai Tokerau-Northland.

Table 20: Potential impact of mango growing in Te Tai Tokerau-Northland

Indicator	Fresh Fruit - Mango	Freeze Dried Mango	Total Mango Industry
GDP ($m)			
Direct	0.15	0.03	0.18
flow-on	0.15	0.01	0.16
Total[a]	0.30	0.05	0.34
Employment (FTE jobs)			
Direct	3	1	3
flow-on	1	1	2
Total[a]	4	1	5

[a] Sums may not add to total due to rounding. Source: BDO analysis

4.4.3.2 Scenario 2 - Papaya Industry Established

Papaya Growing Industry

The potential economic impact for Te Tai Tokerau-Northland of a papaya growing industry is based on the modelling of 1,200,000 kilograms of papaya being grown and sold in a typical year, and the associated costs of growing 20 hectares of papaya under cover.

As summarised in Table 21, the economic modelling shows that this economic activity could generate $1.12 million in GDP, composed of $1.01 million GDP directly, and $110,000 generated through flow on effects.

In terms of employment, this papaya growing sector could employ up to two FTEs directly, and one FTE through the flow on effect of workers spending their wages in the local economy.

Papaya Freeze Drying Industry

A papaya freeze drying industry could process 369,600 kilograms of papaya flesh into 36,960 kilograms of freeze-dried papaya to be exported for a total value of $1,527,423 to Te Tai Tokerau-Northland's economy each year. This activity would incur $1,133,493 in operating costs.

As summarised in Table 21, altogether this economic activity could generate $1.33 million for Te Tai Tokerau-Northland, composed of $1.05 million direct GDP, and $270,000 GDP generated by flow on effects. For this volume of economic activity, a total of ten local FTEs would be generated in Te Tai Tokerau-Northland.

Total Papaya Industry

Cumulatively, a future papaya industry in Te Tai Tokerau-Northland could generate up to $2.06 million GDP directly in a typical year, plus a further $390,000 in flow on effects, for a total of $2.45 million GDP, as shown in Table 21. The development of a 20-hectare papaya industry is also expected to increase employment in Te Tai Tokerau-Northland, resulting in the creation of 13 new FTEs in the region.

Table 21: Potential Economic Impacts of papaya growing in Te Tai Tokerau-Northland

Indicator	Fresh Fruit - Papaya	Freeze Dried Papaya	Total Papaya Industry
GDP ($m)			
Direct	1.01	1.05	2.06
flow-on	0.11	0.27	0.39
Total[a]	1.12	1.33	2.45
Employment (FTE jobs)			
Direct	2	8	10
flow-on	1	2	3
Total[a]	3	10	13

[a] Sums may not add to total due to rounding. Source: BDO analysis

4.5 Revenue scenarios

The revenue figures used in the economic analysis were drawn from stakeholder engagement and desktop research. They are intended to be used in broad economic analysis only, not applied to individual horticultural operations.

Revenue for mango and papaya will vary significantly between orchards, depending on the yield of the orchard and the price that can be commanded in the market. The former of these depends on good farm management and science, and the latter depends on astute business management and marketing. This section provides a range of revenue figures showing how different assumptions of production and price commanded in the market result in different possible revenue figures.

Estimated Range of Mango Revenue

Table 22 summarises a range of expected revenue figures for a hypothetical mango grower. The plausible tonnes sold ranges from 92 to 132 (with 112 tonnes being the amount assumed for 20 hectares, in the economic modelling). Plausible prices range from $2 per kg of mango describing low quality fruit, to $5.5 per kg which would be the premium fruit the New Zealand industry should be aiming for. The economic modelling assumes a price of $3.50 per kg, which at 112 tonnes sold results in $392,000 revenue for growers.

Table 22: Estimated Range of Revenue for Mango

		Quantity of Crop Sold (tonnes)				
		92	102	112	122	132
Price per kg ($)	2	184,000	204,000	224,000	244,000	264,000
	2.5	230,000	255,000	280,000	305,000	330,000
	3	276,000	306,000	336,000	366,000	396,000
	3.5	322,000	357,000	392,000	427,000	462,000
	4	368,000	408,000	448,000	488,000	528,000
	4.5	414,000	459,000	504,000	549,000	594,000
	5	460,000	510,000	560,000	610,000	660,000
	5.5	506,000	561,000	616,000	671,000	726,000

Estimated Range of Papaya Revenue

Table 23 summarises a range of expected revenue figures for a hypothetical papaya grower. The plausible tonnes sold ranges from 220 to 260 tonnes (with 240 tonnes being the amount assumed for 20 hectares, in the economic modelling). Plausible prices range from $3 to $6.50. The economic modelling assumes a price of $5 per kg, which at 240 tonnes sold results in $1.2m revenue for growers.

Table 23: Estimated Range of Revenue for Papaya

		Quantity of Crop Sold (tonnes)				
		220	230	240	250	260
Price per kg ($)	3	660,000	690,000	720,000	750,000	780,000
	3.5	770,000	805,000	840,000	875,000	910,000
	4	880,000	920,000	960,000	1,000,000	1,040,000
	4.5	990,000	1,035,000	1,080,000	1,125,000	1,170,000
	5	1,100,000	1,150,000	1,200,000	1,250,000	1,300,000
	5.5	1,210,000	1,265,000	1,320,000	1,375,000	1,430,000
	6	1,320,000	1,380,000	1,440,000	1,500,000	1,560,000
	6.5	1,430,000	1,495,000	1,560,000	1,625,000	1,690,000

5 Summary of Industry Feasibility

Chapter 5 considers all analysis undertaken, both qualitative and quantitative, to provide commentary on the overall feasibility of establishing a mango or papaya industry in Te Tai Tokerau-Northland from the perspective of different stakeholder groups. It is important to note that the feasibility assessment is based on a modelled industry scenario of a 20-hectare operation and assesses the entire market. Actual results may vary between individual growers and value-add producers due to differences in site conditions, management practices, cultivar selection, and infrastructure.

5.1 Te Tai Tokerau-Northland Mango Industry Feasibility

The feasibility of developing a mango industry at scale in Te Tai Tokerau-Northland has been assessed throughout this report. Table 24 provides a summary of the industry's feasibility, based on the analysis undertaken.

Table 24: Te Tai Tokerau-Northland Mango Industry Feasibility

Stakeholder Group	Comments	Overall Feasibility
Horticulturalists	• **High Capital and Operational Costs:** Developing a commercial mango industry has unique capital costs, such as covered cropping infrastructure, as well as ongoing operational costs. Operational costs are expected to be particularly high as the industry is developing. • **Relatively Low Yields:** The yields of mango per hectare are expected to be low compared to other sub-tropical crops. • **Labour Intensity:** Cultivating mangoes in Te Tai Tokerau-Northland demands a high-level of daily attention and specialised knowledge, which is not widely available in the current workforce. • **Unique Cultivars:** It is critical that cultivars are resilient to Te Tai Tokerau-Northland's environment, and are developed to have optimal skin thickness, yield potential and eating experience. • **Premium Pricing:** The price of fresh mango grown in New Zealand is likely to be more expensive than imported produce. • **The New Zealand Story:** While locally grown mangoes are more expensive, there is likely still demand for them due to local provenance within the domestic market. • **Relatively Low Economic Impact of Fresh Fruit Industry:** $300,000 GDP increase and additional four FTEs generated.	 **Unlikely to be feasible:** Low estimated yields make it difficult to justify the high capital and operating costs. Although there is value in the New Zealand Story, and demand within the market, there is a significant opportunity cost to growing mangoes in Te Tai Tokerau-Northland.

Value-add Producers	• **Required Research and Development:** Research is required to generate commercially feasible value-added products, which is a timely process. • **Funding Constraints:** Significant funding would be required to construct a food process facility to generate value-added products using mango. • **Relatively limited economic opportunity:** $50,000 GDP increase and additional two FTEs generated. Mango inputs into value-added products do not attract a premium price compared to other crops.	 **Unlikely to be feasible:** It is difficult to justify the costs associated with stimulating a value-added industry for locally grown mangoes, particularly given the current scale of the cultivation industry.
Consumers and Commercial Outlets	• **High-quality Produce:** While mango growers in Te Tai Tokerau-Northland have demonstrated the ability to produce quality mangoes that can command a premium price, it appears to be challenging to produce consistent quality at scale in the current stage of the industries development. • **Pricing:** Due to a lack of economies of scale, locally grown mangoes are likely to be more expensive than imported produce. • **Consumer Preferences:** Consumer preferences are shifting, and there is demand for sustainable, locally sourced, and health products – even at a higher price point to alternatives.	 **Potentially feasible:** There is evidence of demand for locally sourced mangoes, as well as consumers paying above market rates. However, producing consistently high-quality produce or value-added products remains challenging.

*Representative of the market outcome, results may differ for each stakeholder.

5.2 Te Tai Tokerau-Northland Papaya Industry Feasibility

The feasibility of developing a *papaya industry at scale in Te Tai Tokerau-Northland has been assessed throughout this report.* Table 25 *provides a summary of the industry's feasibility, based on the analysis undertaken.*

Table 25: Te Tai Tokerau-Northland Papaya Industry Feasibility

Stakeholder Group	Comments	Overall Feasibility
Horticulturalists	• **Land Use Efficiency:** As papaya trees can be planted as close as three metres apart, growers can achieve a better yield per hectare relative to other fruits. • **Relatively Favourable Profit Margin:** While the cultivation of papaya has significant operational costs, the ability to attract a premium sale price for fresh papaya means that horticulturalists could achieve strong profit margins. • **Labour Intensity:** Cultivating papayas demands a high-level of daily attention and specialised knowledge, which is not widely available in the current workforce. • **Unique Cultivars:** It is critical that cultivars are resilient to Te Tai Tokerau-Northland's environment, and are developed to have optimal skin thickness, yield potential and eating experience. • **The New Zealand Story:** While locally grown papayas are more expensive, there is likely still demand for them due to local provenance within the domestic market. • **Strong Economic Impact of Fresh Fruit Industry:** $1.12 million GDP increase and 13 FTEs generated.	 **Likely feasible:** Papaya yields per hectare are greater compared to other plants, meaning farming land can be better utilised. This helps to offset the high capital costs. It is expected that horticulturalists will be able to generate a profit margin through growing papayas in the future. The growing number of papaya horticulturalists in Te Tai Tokerau-Northland is a promising sign for the development of the industry.
Value-add Producers	• **Stepped Extraction:** There is immense potential to utilise the entire papaya in value-add food processing, including the fruit, leaves, skin and seeds. This increases profitability and reduces waste. • **Required Research and Development:** Research is required to generate commercially feasible value-added products, which is a timely process. • **Funding Constraints:** Significant funding would be required to construct a food process facility to generate value-added products using papaya.	 **Likely feasible:** Research and stakeholders indicated that there is significant commercial potential to generate value-added products using papaya. While food processing infrastructure will need to be constructed, this remains a significant opportunity.

	• **High economic opportunity:** $1.33 million GDP increase and ten FTEs generated. This increased economic potential is as papaya value-added products are cable of attracting a premium price.	
Consumers and Commercial Outlets	• **High-quality Produce:** Papaya quality must be consistently high in order to command a premium price. Early-stage commercial growing has demonstrated promise, as yields have been relatively consistent. • **Pricing:** Due to a lack of economies of scale, locally grown papayas are likely to be more expensive than imported produce. • **Consumer Preferences:** Consumer preferences are shifting, and there is demand for sustainable, locally sourced, and health products – even at a higher price point to alternatives.	 **Potentially feasible:** There is evidence of demand for locally sourced papayas, as well as consumers paying above market rates. While the scale of production is currently small, growing trials are showing signs of success.

*Representative of the market outcome, results may differ for each stakeholder.

6 Implementation Plan and Next steps

Through consultation, and the analysis completed, a range of actions and next steps have been determined. Although the feasibility of the mango and papaya industries aren't necessarily certain, if the market were to proceed with developing either industry, a suggested implementation plan is outlined in this Chapter.

To optimise the implementation plan, the key recommended activities have been allocated into short, medium, and long-term categories to prioritise efforts efficiently and effectively.

6.1 Short-term Implementation

Short-term activities refer to immediate or foundational actions that can be completed within the first two (2) years. These are outlined in Table 26.

Table 26: Short-term Implementation

	Action	Detail
	**Agronomic studies and identification of available land**	Commission detailed agronomic studies to assess the suitability of Te Tai Tokerau-Northland's microclimates (e.g. soil, rainfall, humidity, wind shelter) for both mango and papaya varieties. As part of these studies, map the optimal growing zones within Te Tai Tokerau-Northland using GIS climate data, and identify optimal land utilisation strategies.
	**Cultivar research and trials**	Northland Inc to partner with local growers, Iwi landowners and horticultural research institutions to fund small plant trial plots of varying mango or papaya cultivars. Collect data on growth rates, flowering, fruit set, pest/disease, growing techniques, yields and fruit quality. Identify which cultivars are optimal for Te Tai Tokerau-Northland's climate. Additional genetic research could also be undertaken in relation to the crossbreeding of plants to develop a mango or papaya that has a superior yield and taste profile.
	**Investigate optimal crop cover systems**	To grow mangoes or papayas in Te Tai Tokerau-Northland, covered cropping systems are required. These materials are currently expensive, particularly in Te Tai Tokerau-Northland, where there is no local installer. Investigate cost effective cropping solutions and coordinate the procurement of covered cropping infrastructure.
	**Industry Engagement and Partnerships**	Northland Inc to establish a Te Tai Tokerau-Northland Sub-tropical Fruits Working Group, made up of growers, Māori landowners, food processors, researchers, marketers and others. The intention is for this group to be incubated by Northland Inc, but eventually industry led. The role of this group will be to share knowledge, discuss opportunities for industry collaboration, as well as determine and implement priority actions to support the development of the sub-tropical fruit industry in Te Tai Tokerau-Northland. For example, this could include establishing a streamlined digital platform to capture and share localised crop growing and research data.

6.2 Medium-term Implementation

Medium-term activities may require more planning, investment, or coordination. These medium-term actions should take place between year three (3) and year four (4) and are outlined in Table 27.

Table 27: Medium Term Implementation

	Action	Detail
	**Value-add product analysis**	Partner with research institutions and food processors to undertake in-depth research to: • Develop value-add products using mango and papaya produce, as well as the size of the commercial opportunity. • Explore opportunities to utilise 'b-grade' produce, or crop waste streams in products. • Assess the size and likelihood of export markets who may use mango and papaya as product inputs (e.g. nutraceutical and cosmeceutical markets).
	**Detailed Business Case for food processing facility**	Leveraging the existing *Food North Food and Beverage Business Case,* Northland Inc to co-develop an investment grade detailed business case for a food processing facility in Te Tai Tokerau-Northland. This detailed business case should include thorough demand, cost, manufacturing capability and capacity (e.g. juicing, drying, extracting, packaging), cost-benefit analysis, operating model and delivery model (e.g. co-op model or otherwise) analysis and recommendations. This detailed business case should be leveraged by Northland Inc to proactively advocate for funding to develop the value-add food processing facility.
	**Training and workforce development**	Partner with industry and educational bodies to develop horticultural training programmes or micro-credentialing courses in sub-tropical fruit growing, production and post-harvest handling. These programmes should be developed in partnership with growers, with internships or seasonal working opportunities available.

6.3 Long-term Implementation

Long-term activities represent more strategic or infrastructure-orientated initiatives. These actions may occur in five (5) + years and are outlined in Table 28.

Table 28: Long Term Implementation

	Action	Detail
	**Construct food processing facility**	Construct a food processing and packaging facility in Te Tai Tokerau-Northland to support the development of local mango or papaya value-added products, among other crops.
	**Promote NZ produce and its unique factors in a coordinated way**	Actively create and promote a Te Tai Tokerau-Northland grown fruit brand, leveraging provenance, New Zealand's story, food safety credentials, and Māori growing principles. Develop relationships with domestic distributors and export brokers. To ensure success, a marketing body could be established to act as the single global marketer for New Zealand-grown mango or papaya, enabling consistent branding, quality control, and strategic market access. This unified approach would allow the industry to avoid internal competition, stabilise prices, and build a strong global identity around New Zealand mango or papaya.

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